PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
CRT2193

HIDE-AWAY DAB TUNER

GEX-P900DAB EW

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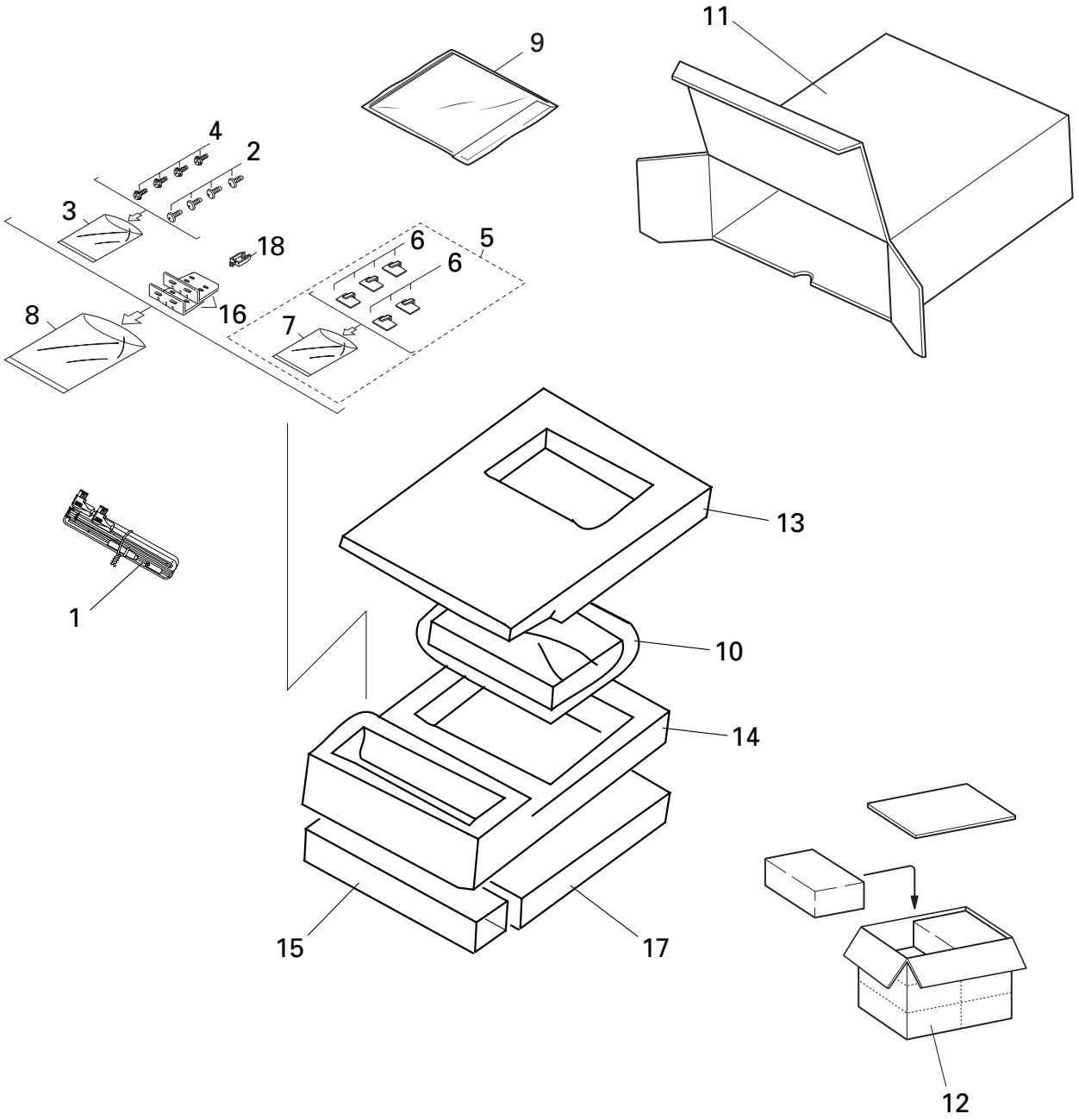
1. SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty.
If you are not qualified to perform the repair of this product properly and safely; you should not risk trying to do so and refer the repair to a qualified service technician.

2. EXPLODED VIEWS AND PARTS LIST

2.1 PACKING



● PACKING SECTION PARTS LIST

NOTE:

● Parts marked by "*"are generally unavailable because they are not in our Master Spare Parts List.

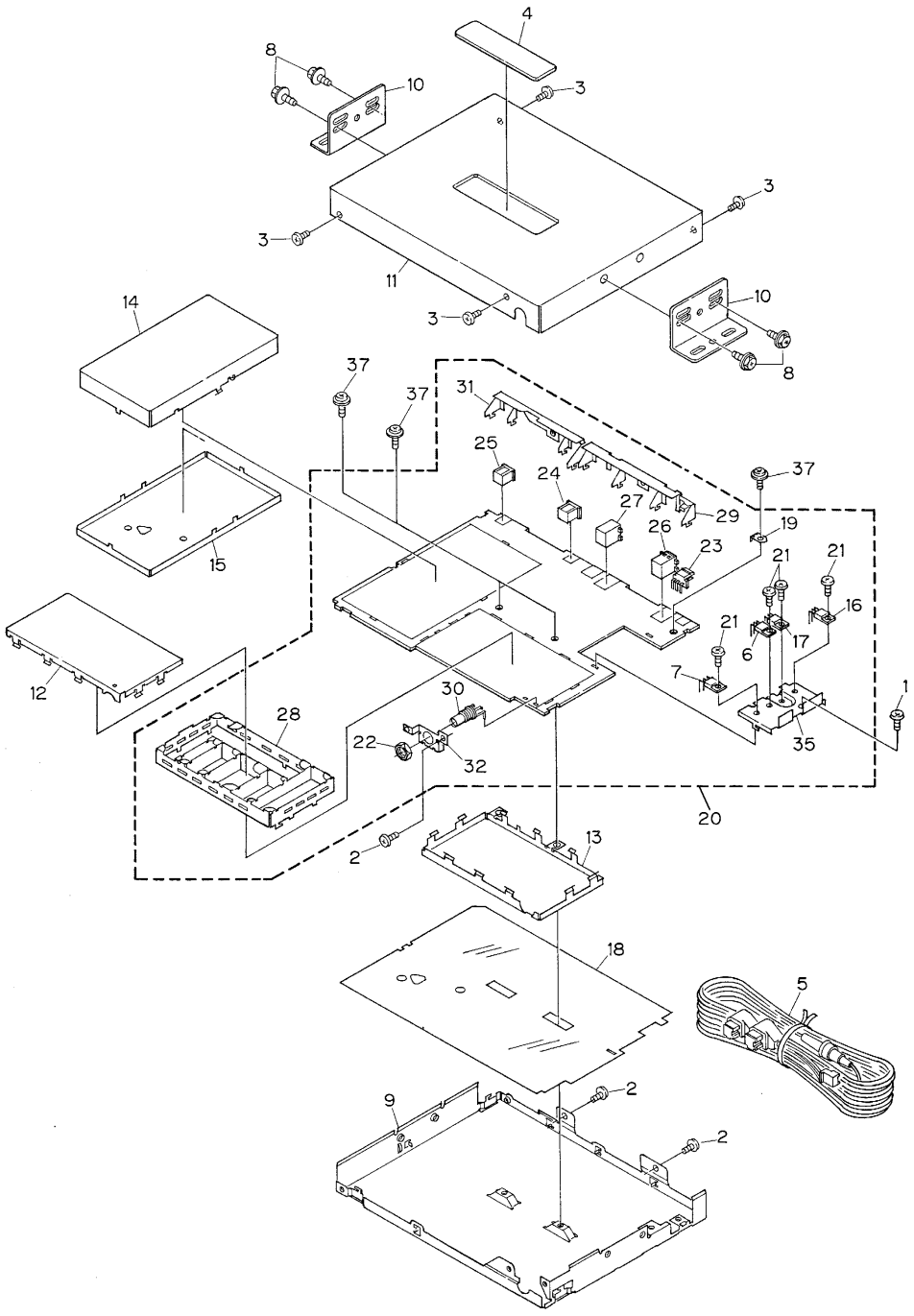
● Screws adjacent to ∇ mark on the product are used for disassembly.

Mark	No.	Description	Part No.
	1	Cord	CDE5445
	2	Screw	BNC40P120FZK
*	3	Polyethylene Bag	CEG1158
	4	Screw	HMF40P060FZK
	5	Cord Clamper Assy	CEA2444
	6	Cord Clamper	CNV5468
*	7	Polyethylene Bag	E36-615
*	8	Polyethylene Bag	CEG1101
	9-1	Owner's Manual	CRD2721
	9-2	Owner's Manual	CRD2722
	9-3	Installation Manual	CRD2723
*	9-4	Warranty Card	CRY1087
	9-5	Fastener(x2)	CNM3728
	9-6	Polyethylene Bag	CEG1116
	10	Polyethylene Bag	CEG1190
	11	Carton	CHG3514
	12	Contain Box	CHL3514
	13	Protector	CHP2057
	14	Protector	CHP2058
	15	Spacer	CHW1713
	16	Angle	CNB2351
	17	Antenna Assy	CXB2841
	18	Clamper	CNV1343

● Owner's Manual, Installation Manual

Part No.	Language
CRD2721	English, Spanish, German
CRD2722	French, Italian, Dutch
CRD2723	English, Spanish, German,
	French, Italian, Dutch

2.2 EXTERIOR


4
8
10
3
3
3
11
3
10
8
14
37
37
31
25
24
27
29
26
23
37
19
21
21
16
21
6
17
7
1
35
15
12
28
30
22
32
20
2
13
18
5
9
2
2

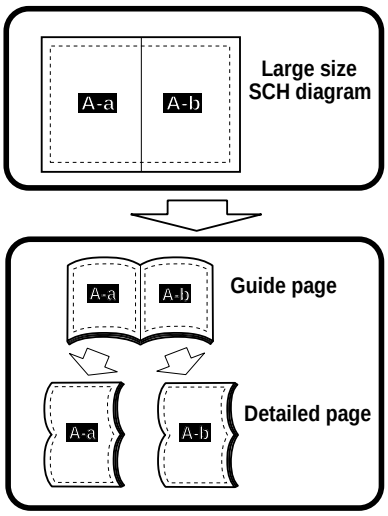
● EXTERIOR SECTION PARTS LIST

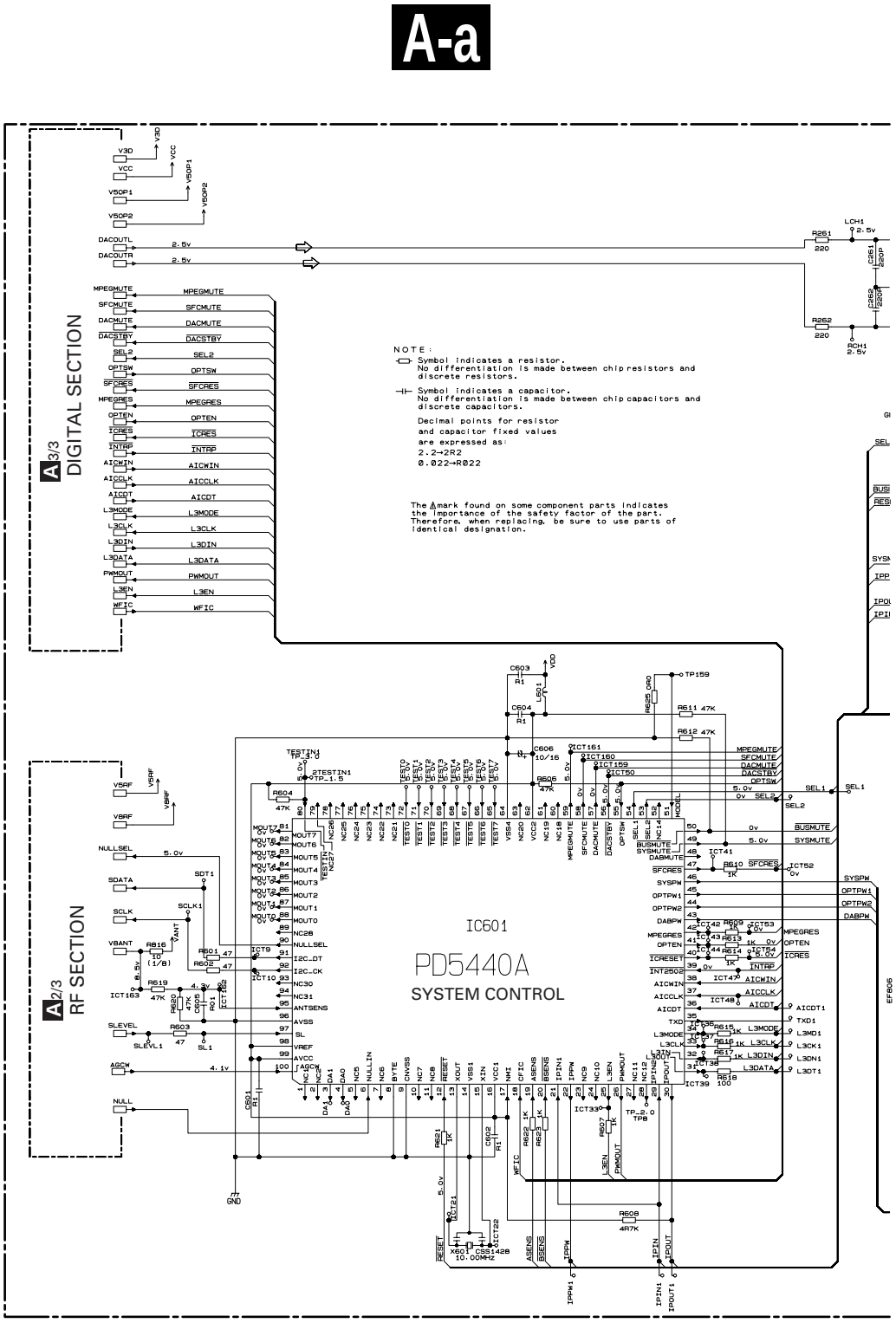
Mark No.	Description	Part No.
1	Screw	BSZ26P060FMC
2	Screw	BSZ30P060FMC
3	Screw	BSZ30P060FZK
4	Plate	CAH1654
5	Cord	CDE5445
6	IC(IC803)	PQ3RF23
7	IC(IC802)	PQ30RV1
8	Screw	HMF40P060FZK
9	Chassis	CNA2014
10	Angle	CNB2351
11	Case	CNB2268
12	Shield	CNC7513
13	Shield	CNC7514
14	Shield	CNC7515
15	Shield	CNC7516
16	Transistor(Q803)	2SB945
17	IC(IC804)	NJM7805FA
18	Insulator	CNM5804
19	Terminal(CN802)	CKF1059
20	Main Unit	CWM5731
21	Screw	BMZ26P060FMC
22	Nut	CBN1026
23	Plug(CN801)	CKS-460
24	Connector(CN222)	CKS2104
25	Connector(CN221)	CKS2600
26	Connector(CN262)	CKS3409
27	Connector(CN261)	CKS3414
28	Shield	CNC7512
29	Holder	CNC7518
30	Antenna Jack(CN401)	CKX1059
31	Holder	CNC7519
32	Holder	CNC7517
33,34	•••••	
35	Holder	CNC7520
36	•••••	
37	Screw	ISS26P060FMC

3. SCHEMATIC DIAGRAM

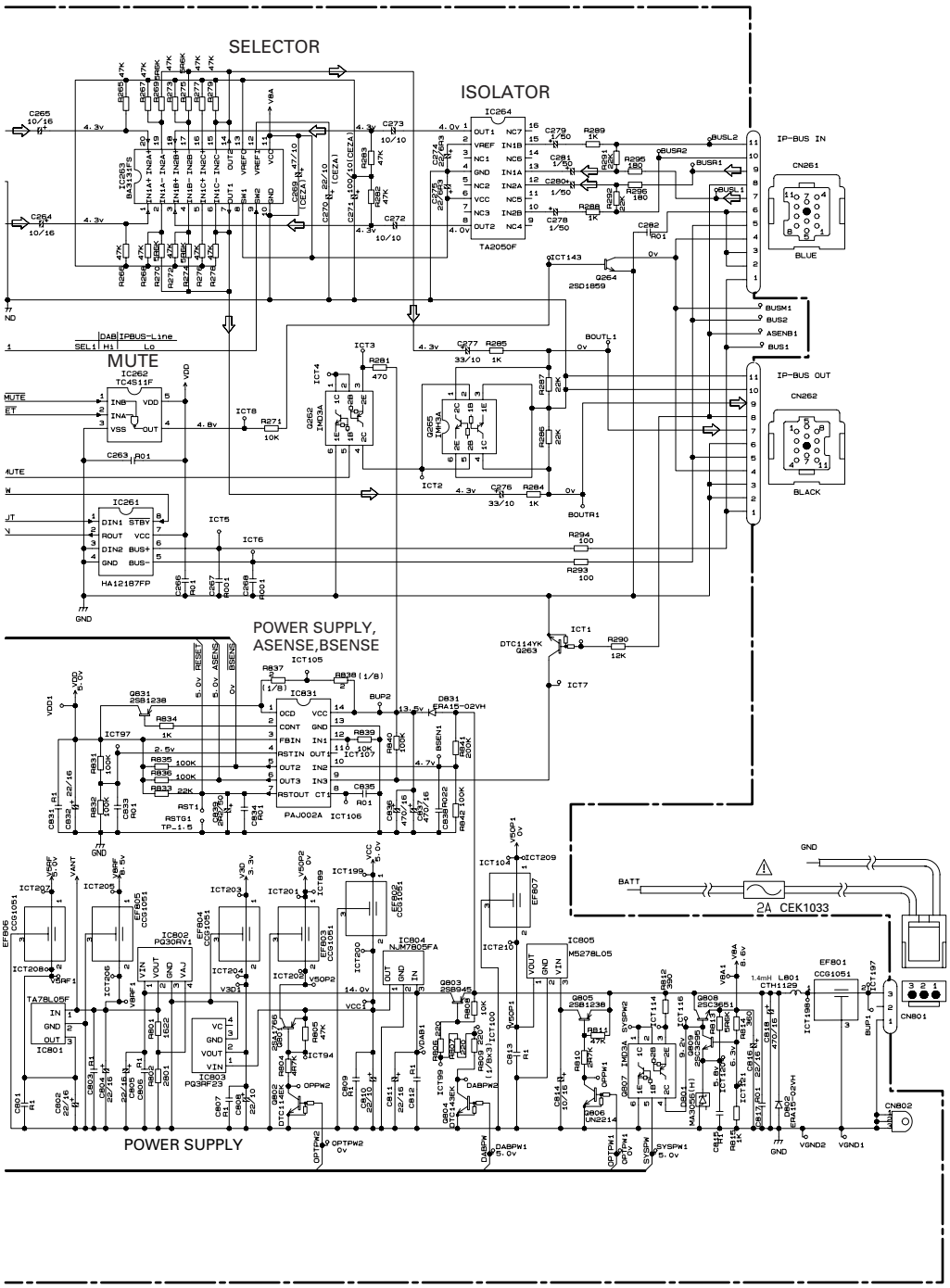
3.1 MAIN UNIT(1/3)

Note: When ordering service parts, be sure to refer to “EXPLODED VIEWS AND PARTS LIST” or “ELECTRICAL PARTS LIST”.




A-a
A3/3 DIGITAL SECTION
A2/3 RF SECTION
IC601
PD5440A
SYSTEM CONTROL
NOTE :
Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.
Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.
Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022
The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

A-b


SELECTOR
ISOLATOR
MUTE
POWER SUPPLY, ASENSE,BSENSE
POWER SUPPLY
IP-BUS IN
IP-BUS OUT
BLUE
BLACK
2A CEK1033

A-a A-b

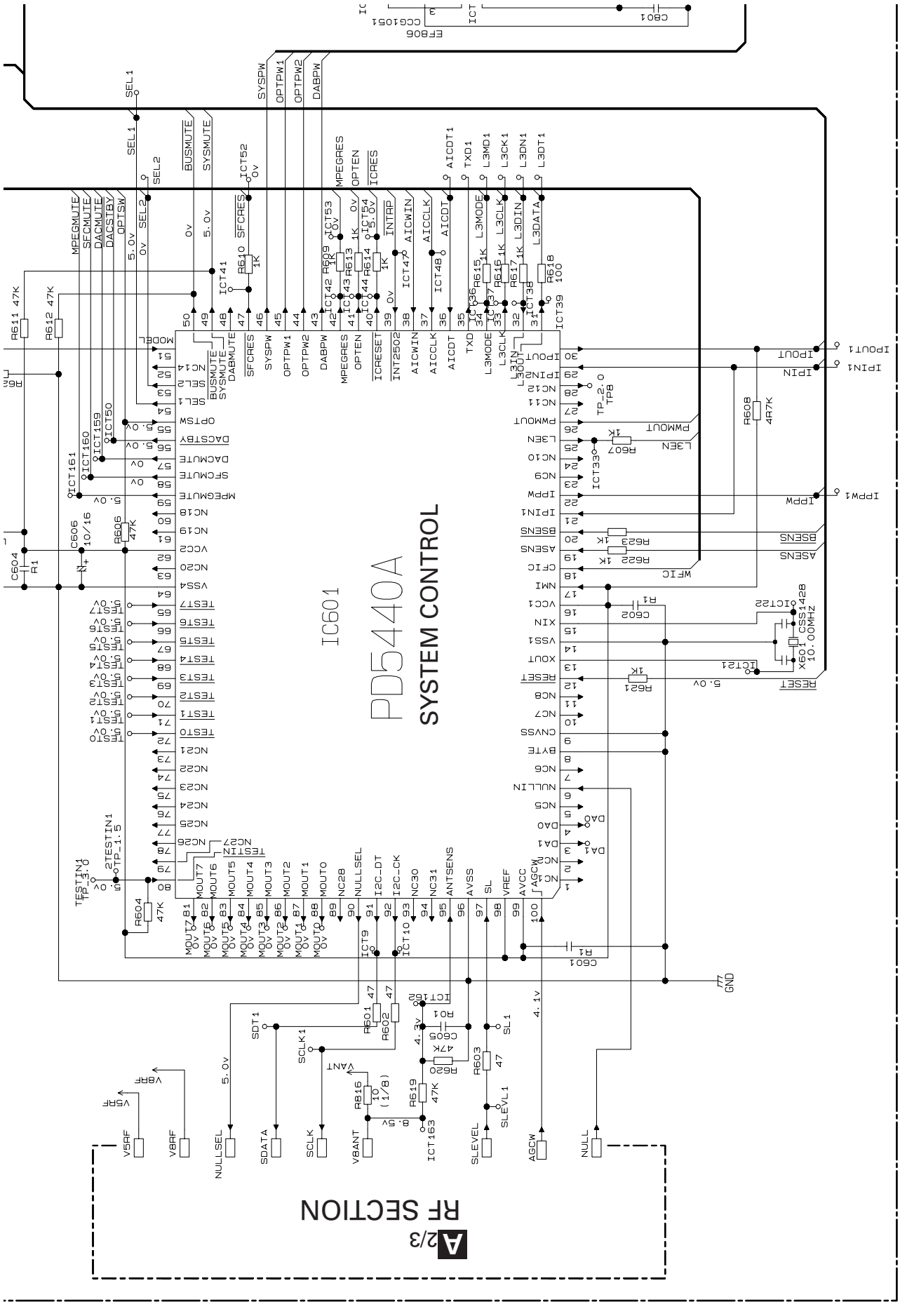
A-a 1/3

A 3/3

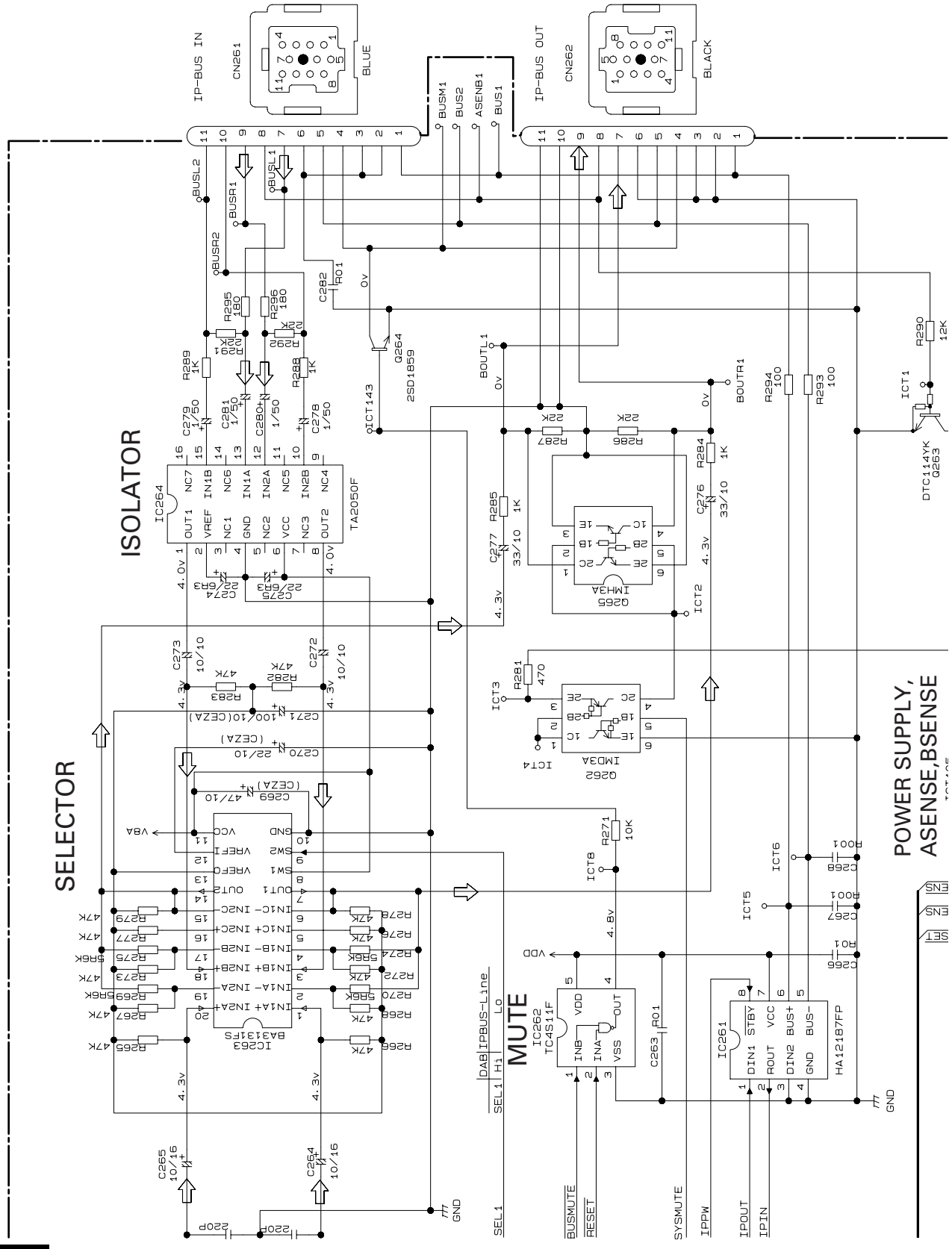
DIGITAL SECTION

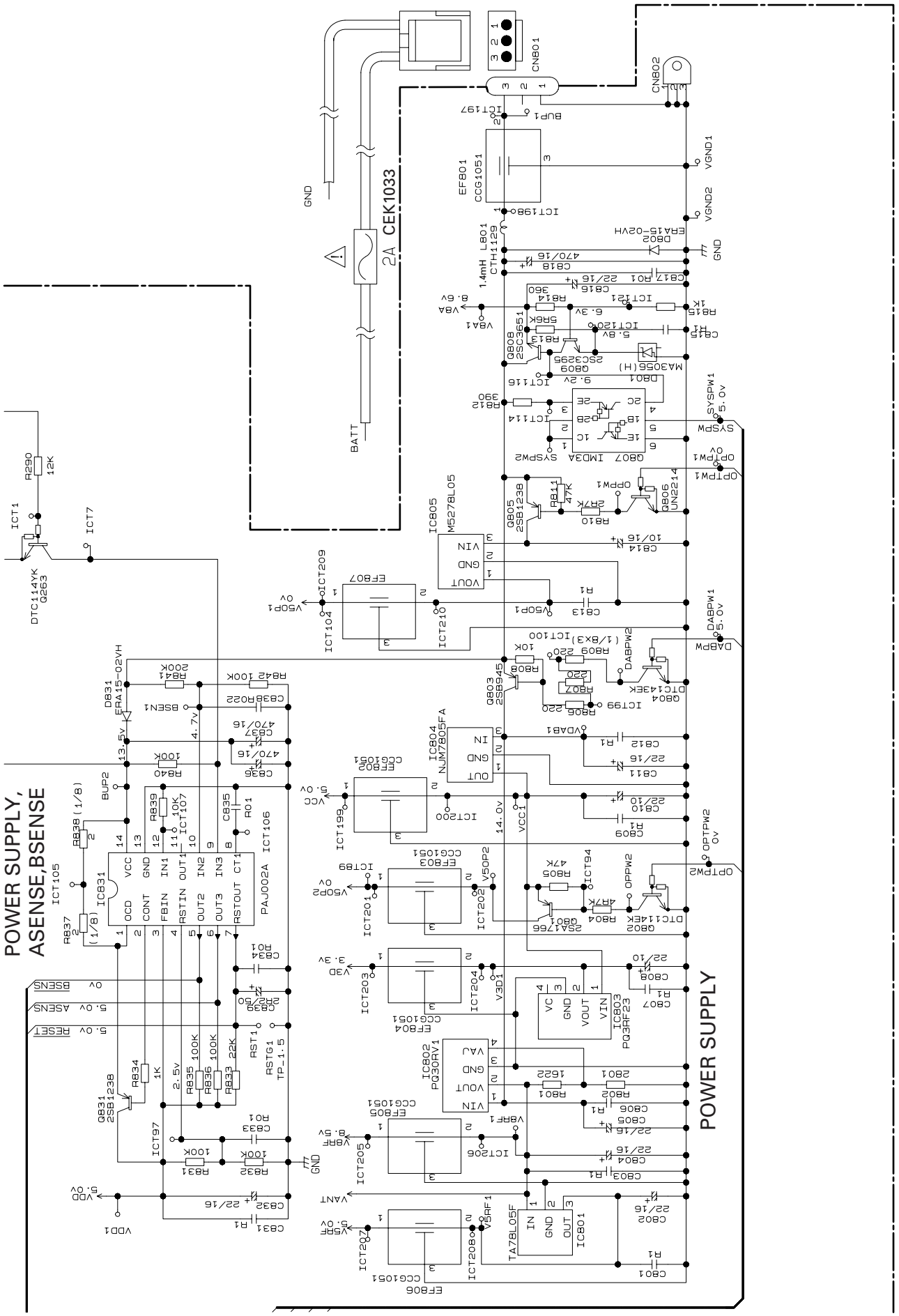
NOTE :
Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.
Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.
Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

The ⚠mark found on some component parts indicates the importance of the safety factor of the part.
Therefore, when replacing, be sure to use parts of identical designation.

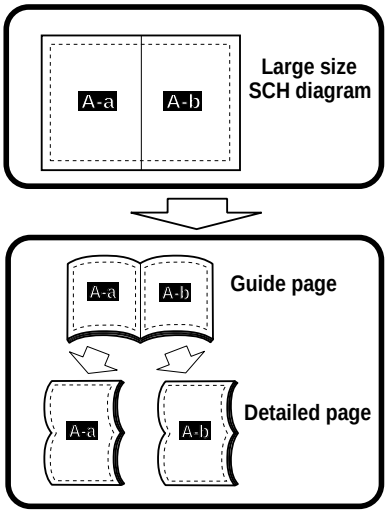

IC601
PD5440A
SYSTEM CONTROL
A 2/3
RF SECTION
SEL1
SEL2
BUSMUTE
SYSMUTE
SFCRES
SYSPW
OPTPW1
OPTPW2
DABPW
MPEGRES
OPTEN
ICRES
INTRP
AICWIN
AICCLK
AICDT
TXD1
L3MD1
L3CK1
L3DN1
L3DT1
MPEGMUTE
SFCMUTE
DACMUTE
DACSTBY
OPTSW
L3MODE
L3CLK
L3DIN
L3DATA
IPOUT1
IPIN1
IPPW1
PWMOUT
L3EN
BSENS
ASENS
WFIC
RESET
X601 CSS1428 10.00MHz
SDT1
SCLK1
VANT
SL1
SLEVL1
AGCW
NULL
NULLSEL
SDATA
SCLK
VBANT
SLEVEL
V8RF
V5RF
GND
4.1V
5.0V
8.5V
4.3V

A-a A-b

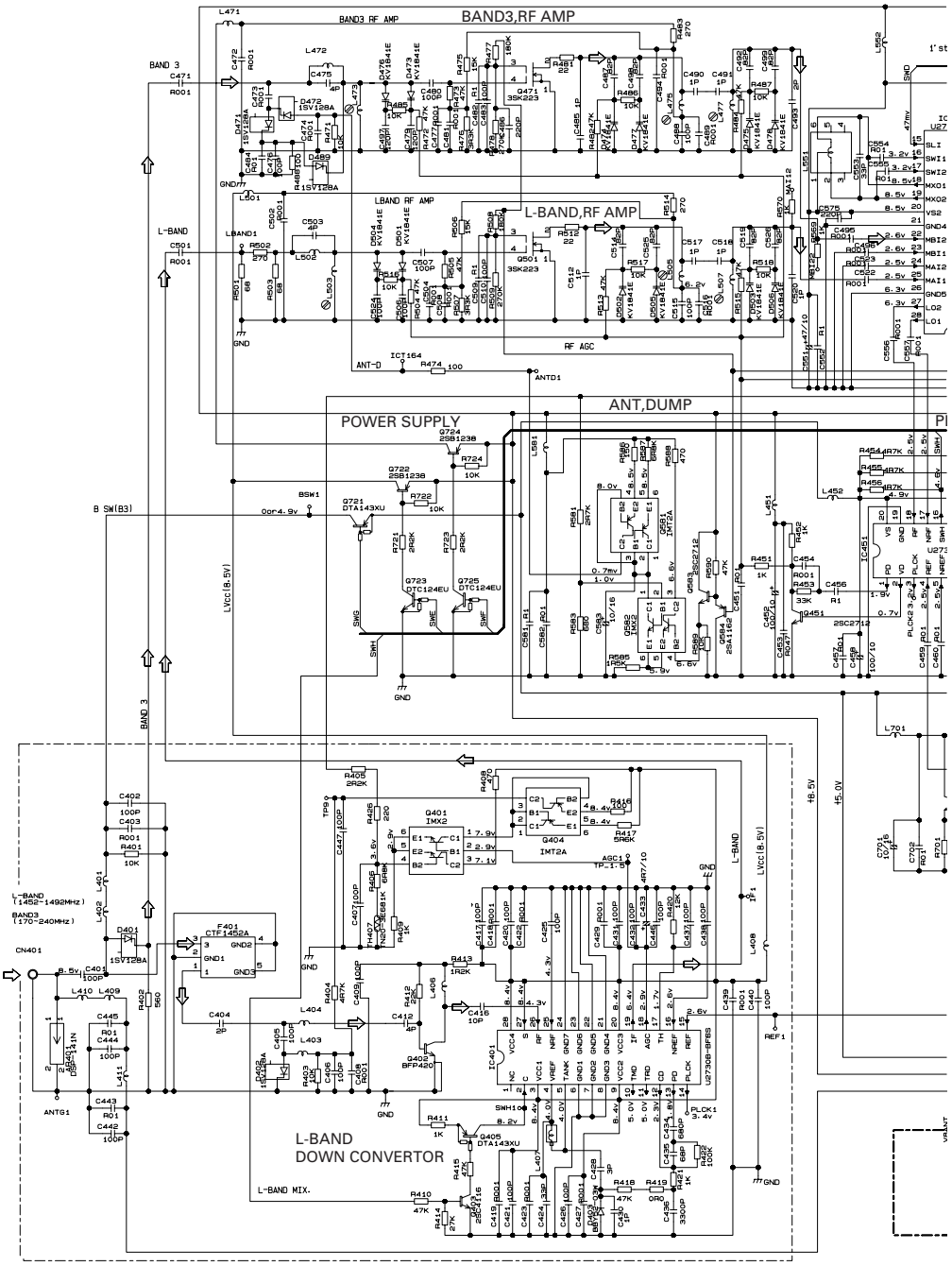

IP-BUS IN
CN261
BLUE
IP-BUS OUT
CN262
BLACK
BUSM1
BUS2
ASENB1
BUS1
BUSL2
BUSR1
BUSL1
BUSR2
ISOLATOR
IC264
TA2050F
SELECTOR
IC263
BA3131FS
MUTE
IC262
TC4S11F
IC261
HA12187FP
POWER SUPPLY, ASENSE,BSENSE
Q264
2SD1859
DTC114YK
Q263
Q265
IMH3A
Q262
IMD3A
BOUTL1
BOUTR1
ICT143
ICT1
ICT2
ICT3
ICT4
ICT5
ICT6
ICT8
VBA
VDD
GND
SEL1
BUSMUTE
RESET
SYSMUTE
IPPW
IPOUT
IPIN
ENS
SET


POWER SUPPLY,
ASENSE,BSENSE
POWER SUPPLY
2A CEK1033
GND
BATT
CNB01
CNB02
BUP1
EF801
CCG1051
VGND1
VGND2
GND
1.4mH L801
CTH1129
EFA15-02VH
D802
IC805
M5278L05
VIN
GND
VOUT
IC804
NJM7805FA
IC803
PQ3RF23
IC802
PQ30RV1
IC801
TA78L05F
IC831
PAJ002A
IC105
IC106
IC107
Q803
2SB945
Q805
2SB1238
Q809
2SC3295
Q807
IMD3A
Q806
UN2214
Q802
DTC143EK
Q801
2SA1766
Q831
2SB1238
DTC114YK
Q263
SYSPW1
5.0V
OPTPW1
0V
DABPW1
5.0V
OPPW2
OPTPW2
0V
VBAT
8.6V
6.3V
5.8V
9.2V
14.0V
3.3V
8.5V
5.0V
2.5V
4.7V
VCC
VDD
VANT
VSRF
ASENS
RESET
BSENS
BSEN1
RST1
RSTG1
TP-1.5

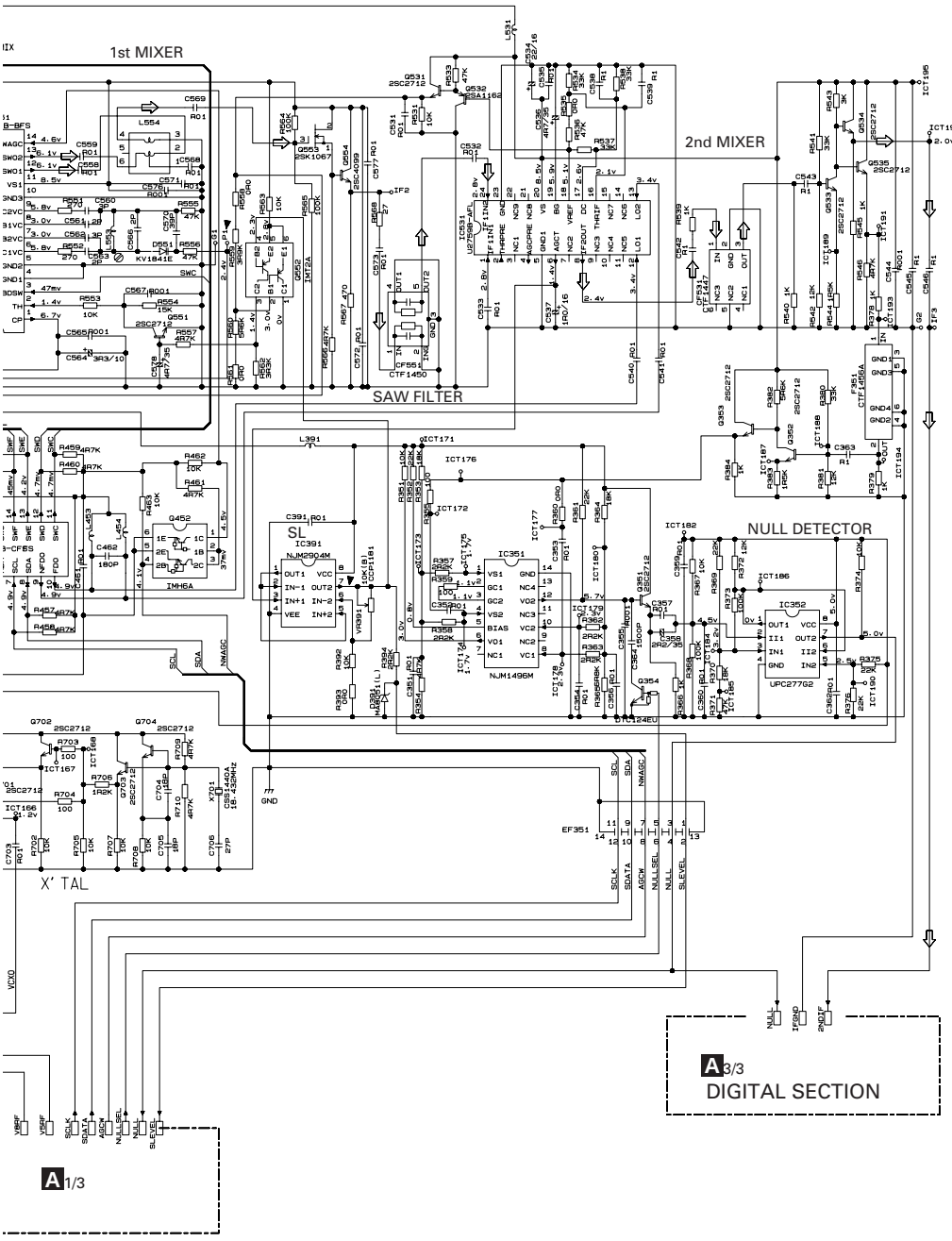
3.2 MAIN UNIT(2/3)



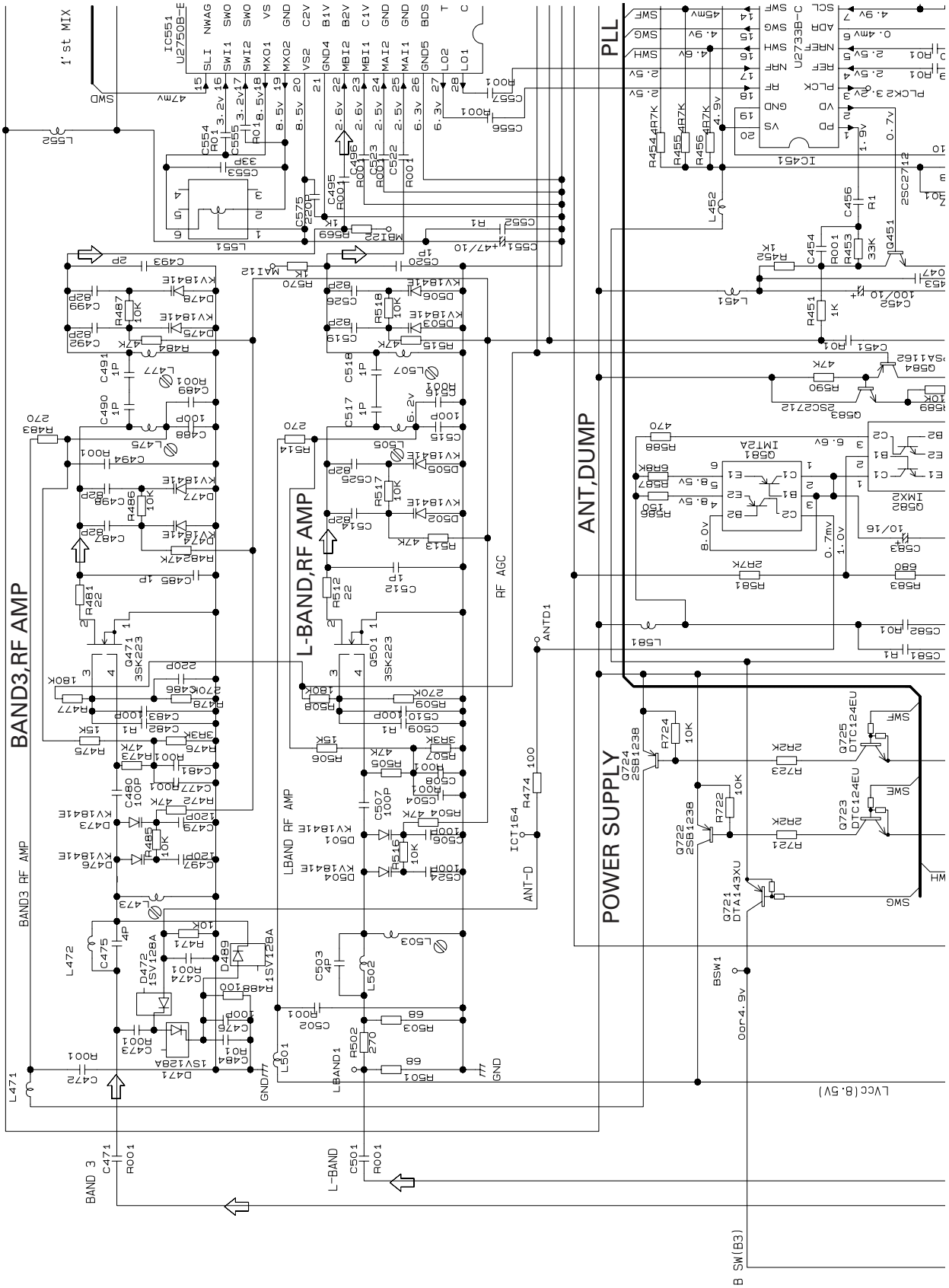
A-a

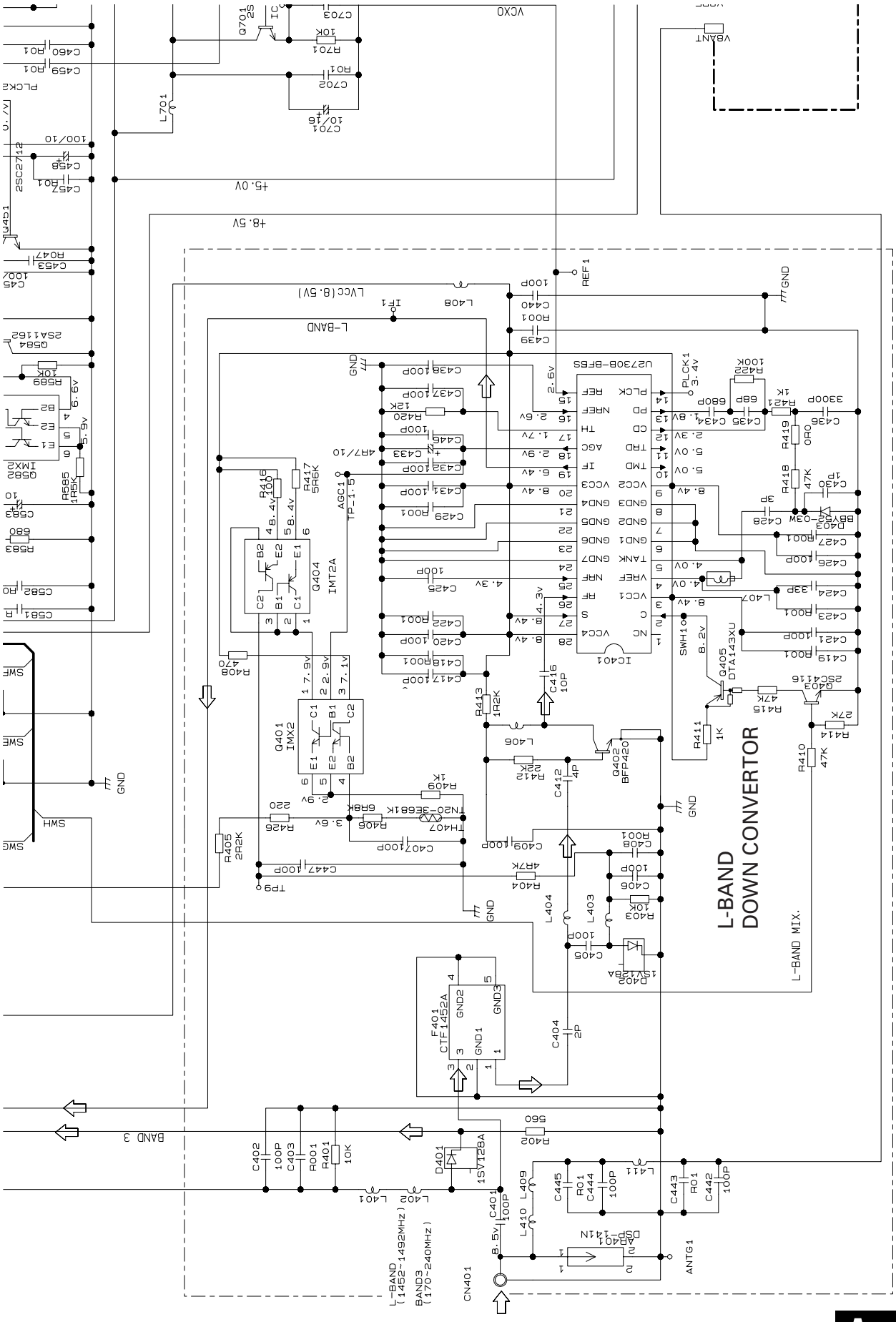


A-b

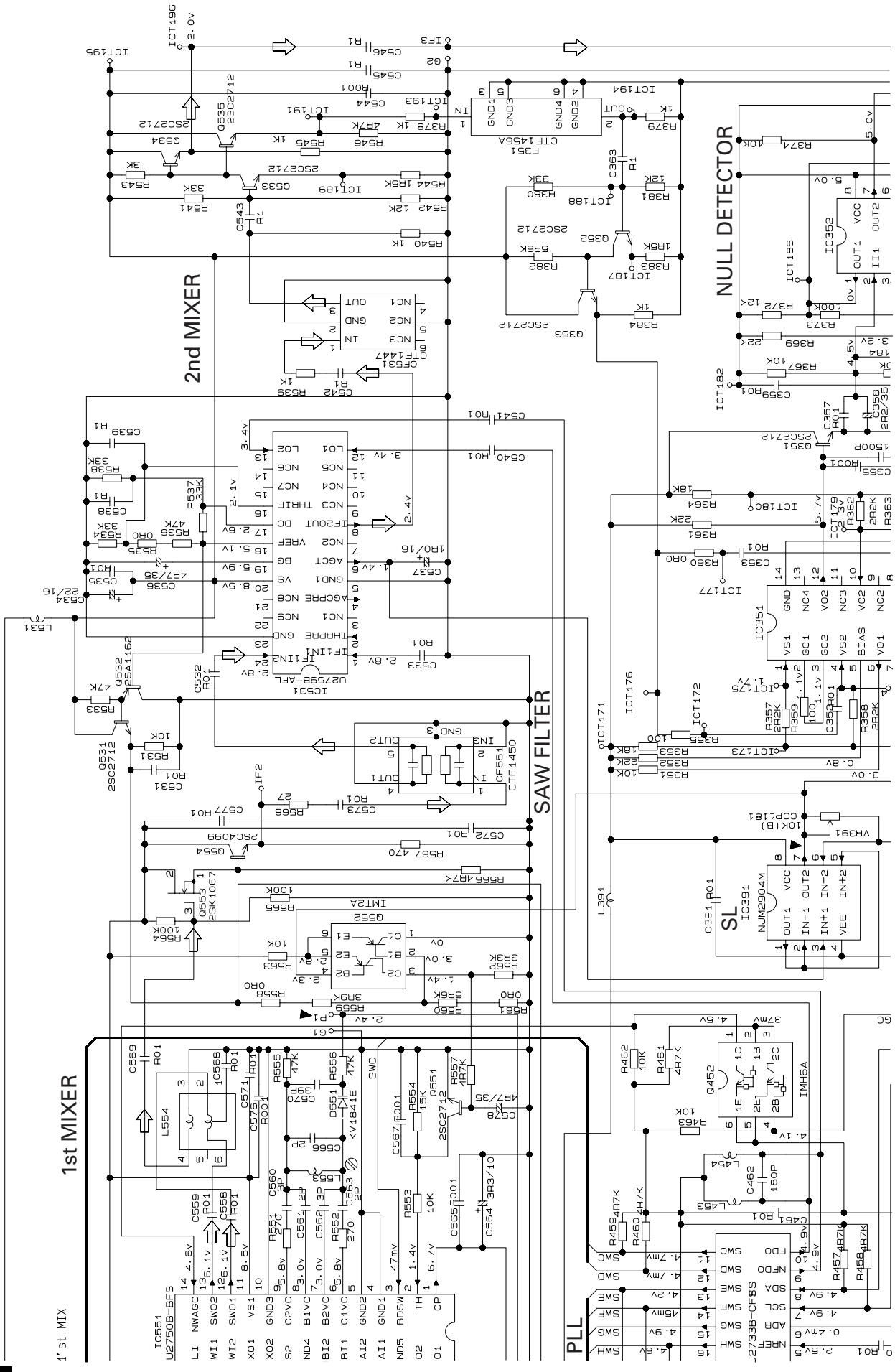

1st MIXER
2nd MIXER
SAW FILTER
SL
NULL DETECTOR
X' TAL
A 3/3
DIGITAL SECTION
A 1/3

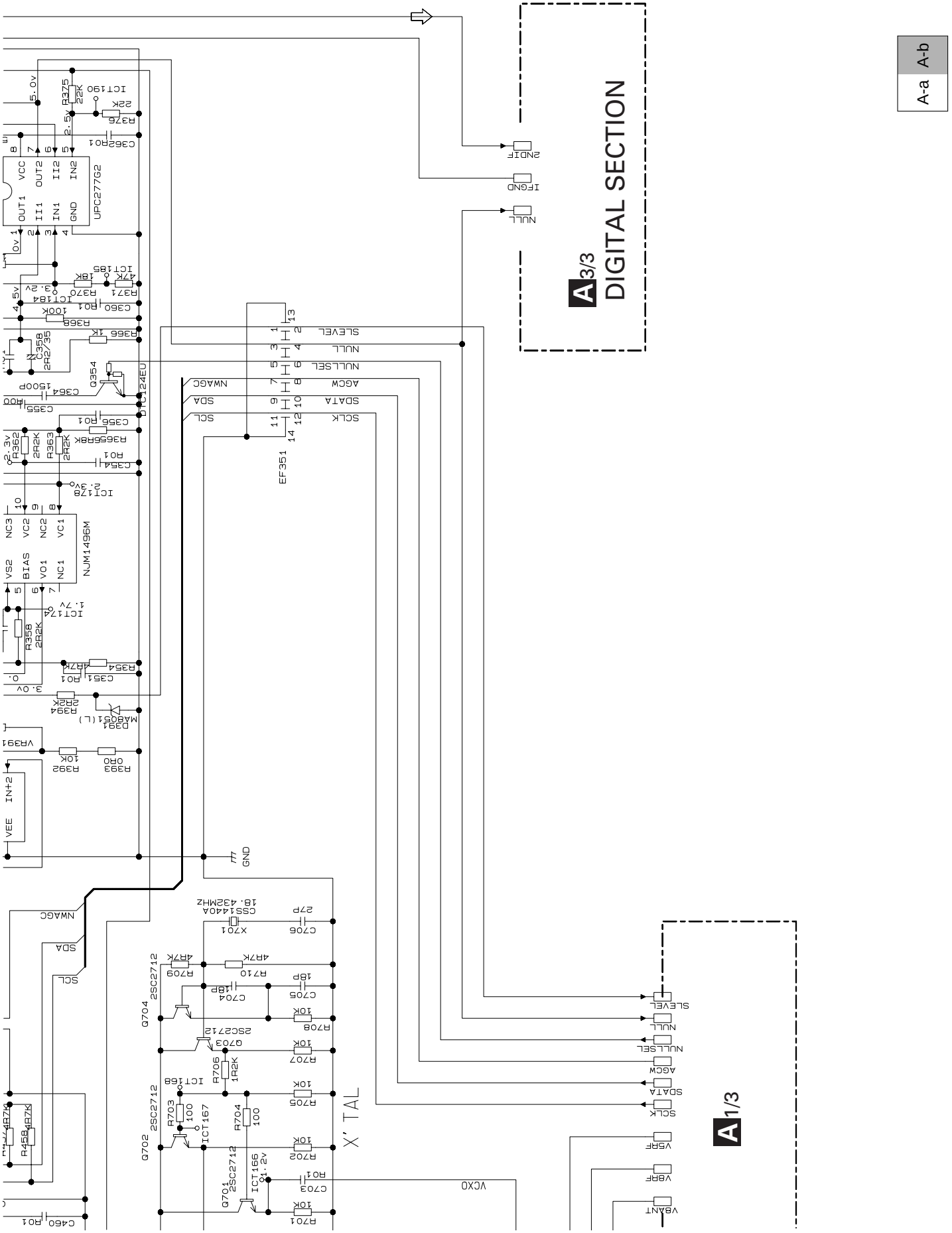
A-b
A-a


PLL
ANT,DUMP
POWER SUPPLY
BAND3,RF AMP
L-BAND,RF AMP
BAND3 RF AMP
LBAND RF AMP
RF AGC
1'st MIX
IC551
U2750B-E
U2733B-C
IC451
Q451
Q581
IMT2A
Q582
IMX2
Q584
2SA1162
2SC2712
Q583
2SC2712
Q721
DTA143XU
Q722
2SB1238
Q723
DTC124EU
Q724
2SB1238
Q725
DTC124EU
D472
1SV128A
D473
1SV128A
D471
1SV128A
Q471
3SK223
Q501
3SK223
L551
L552
L451
L452
L471
L472
L473
L501
L502
L503
L507
L581
L582
L583
L584
ANTD1
ANT-D
ICT164
BAND 3
L-BAND
B SW(B3)
BSW1
LVCC(8.5V)
SWD
SWE
SWF
SWG
HM

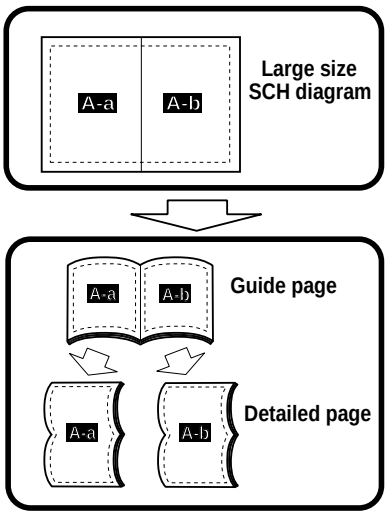

L-BAND
DOWN CONVERTOR
L-BAND MIX.
A-a 2/3
A-a
A-b

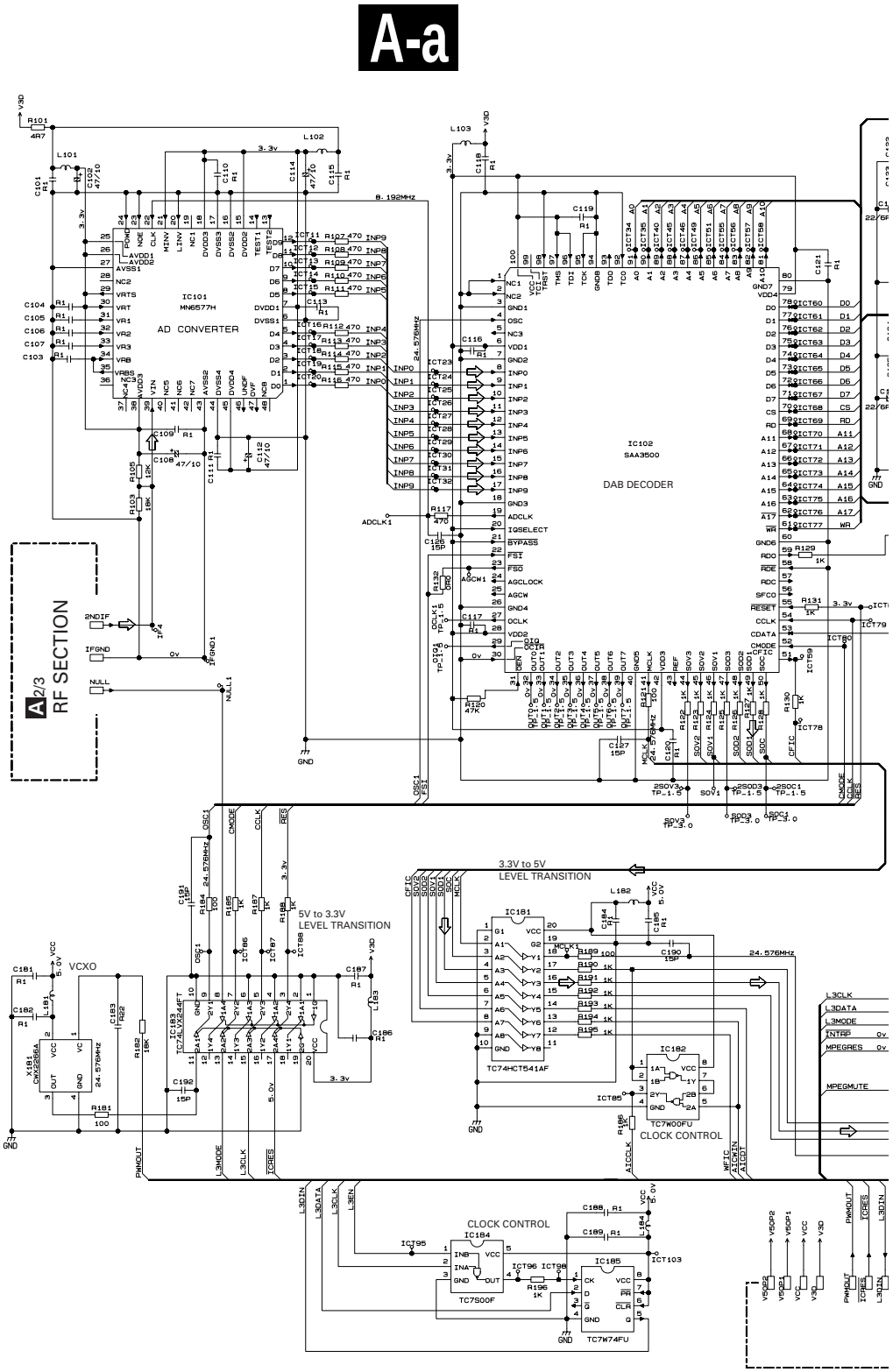
A-a A-b


1st MIXER
2nd MIXER
SAW FILTER
NULL DETECTOR
PLL
SL
IC551 U2750B-BFS
IC352
IC391 NJM2904M
IC351
IC539 U2759B-AFL
IC733B-CFBS


A3/3 DIGITAL SECTION
2NDIF
IFGND
NULL
SLEVEL
NULL
NULLSEL
AGCW
SDATA
SCLK
A1/3
X'TAL
VCXO
VSRF
VBRF
VBANT
GND
NWAGC
SDA
SCL
UPC277G2
NJM1496M
EF351
DTC124EU
MA8051(L)
CSS1440A
18.432MHZ
2SC2712
2SC2712S
UPC1184
UPC1190
UPC1185
UPC1178
UPC1174
UPC1168
UPC1167
UPC1166
A-a
A-b

3.3 MAIN UNIT(3/3)





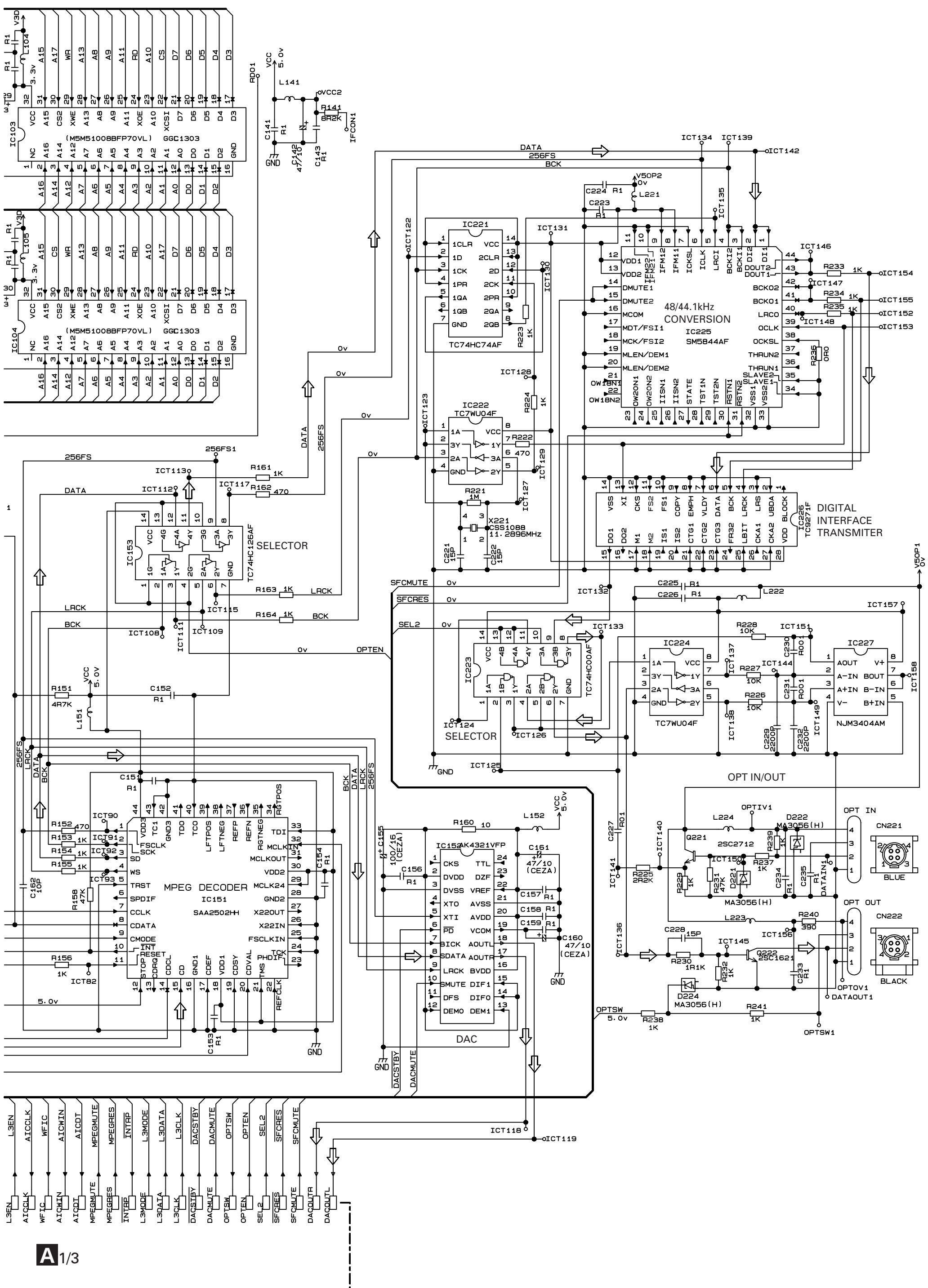
A

B

C

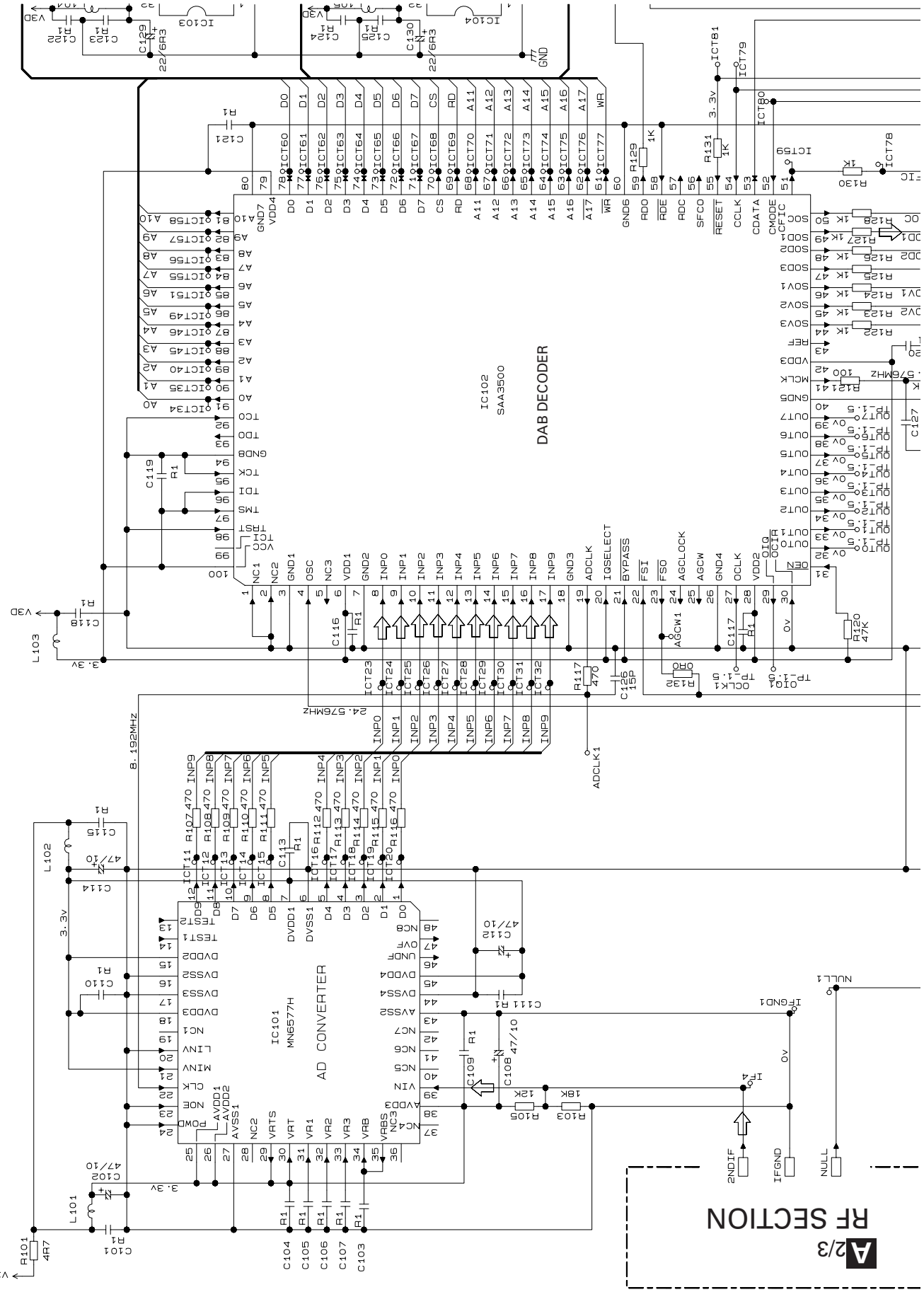
D

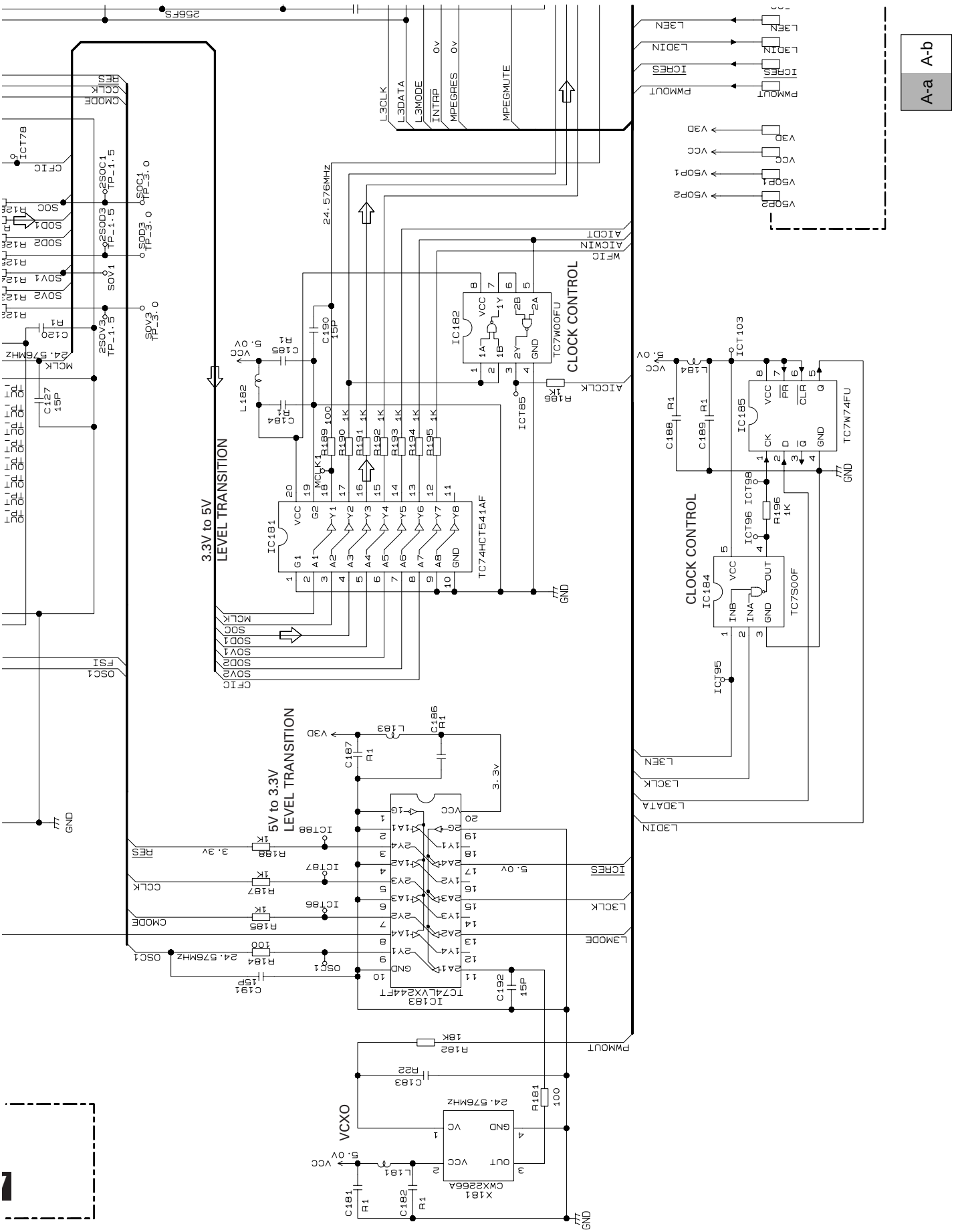
A-b


IC103
(M5M51008BFP70VL) GGC1303
IC104
(M5M51008BFP70VL) GGC1303
L104
L105
L141
VCC 5.0v
RDO1
VCC2
R141 8R2K
IFCON1
C141
C142 47/10
C143
GND
DATA
256FS
BCK
IC221
TC74HC74AF
IC222
TC7WU04F
X221 CSS1088 11.2896MHz
48/44.1kHz CONVERSION
IC225
SM5844AF
IC226 TC9271F
DIGITAL INTERFACE TRANSMITER
IC153
TC74HC126AF
SELECTOR
IC223
TC74HC00AF
SELECTOR
IC224
TC7WU04F
IC227
NJM3404AM
OPT IN/OUT
OPT IN
CN221
BLUE
OPT OUT
CN222
BLACK
Q221 2SC2712
Q222 2SC1621
D221 MA3056(H)
D222 MA3056(H)
D224 MA3056(H)
MPEG DECODER
IC151
SAA2502HH
IC152 AK4321VFP
DAC
SFCMUTE
SFCRES
SEL2
OPTEN
OPTSW
DACSTBY
DACMUTE
L3EN
AICCLK
WFIC
AICWIN
AICDT
MPEGMUTE
MPEGRES
INTRP
L3MODE
L3DATA
L3CLK
DACOUTR
DACOUTL

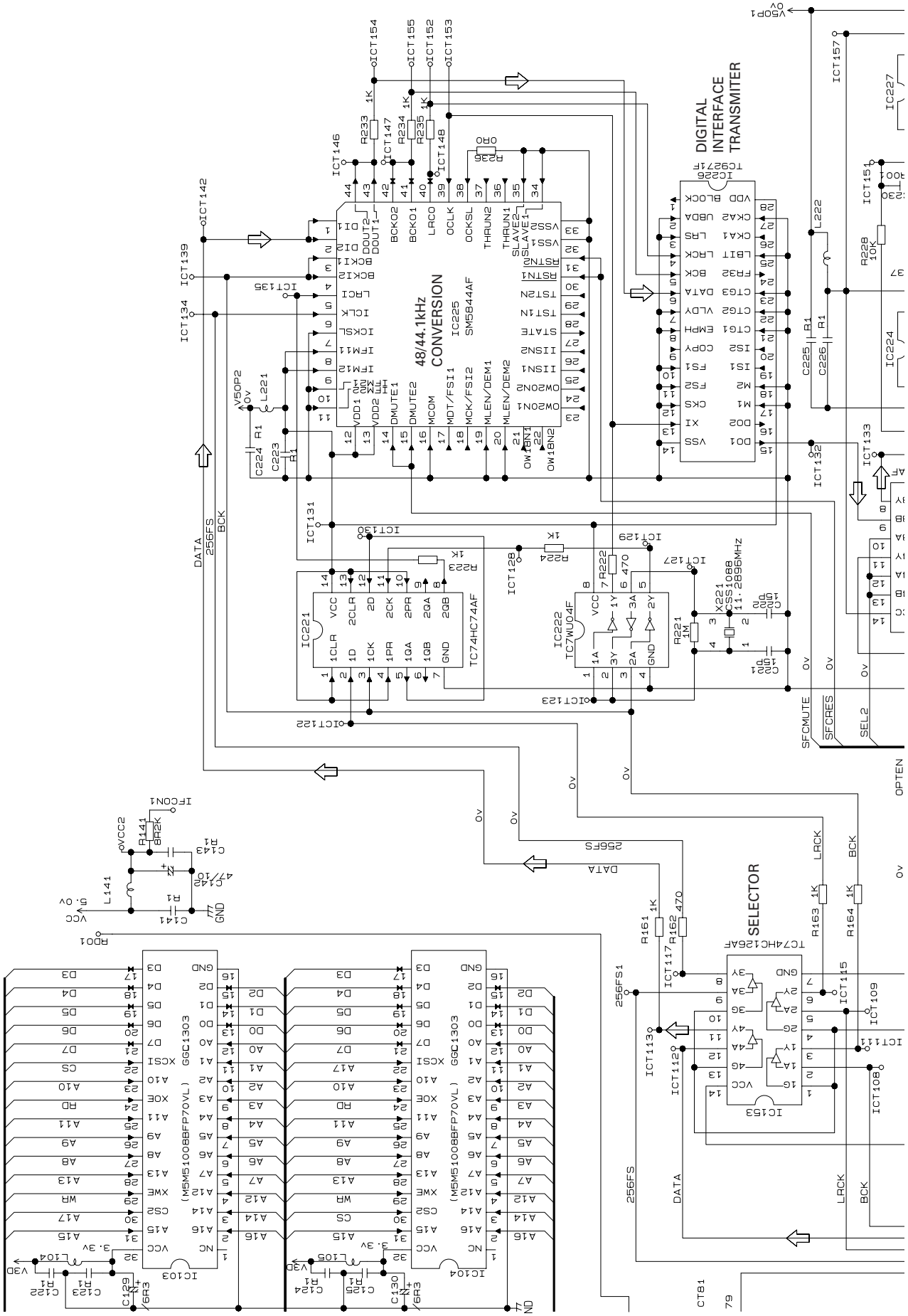
A 1/3

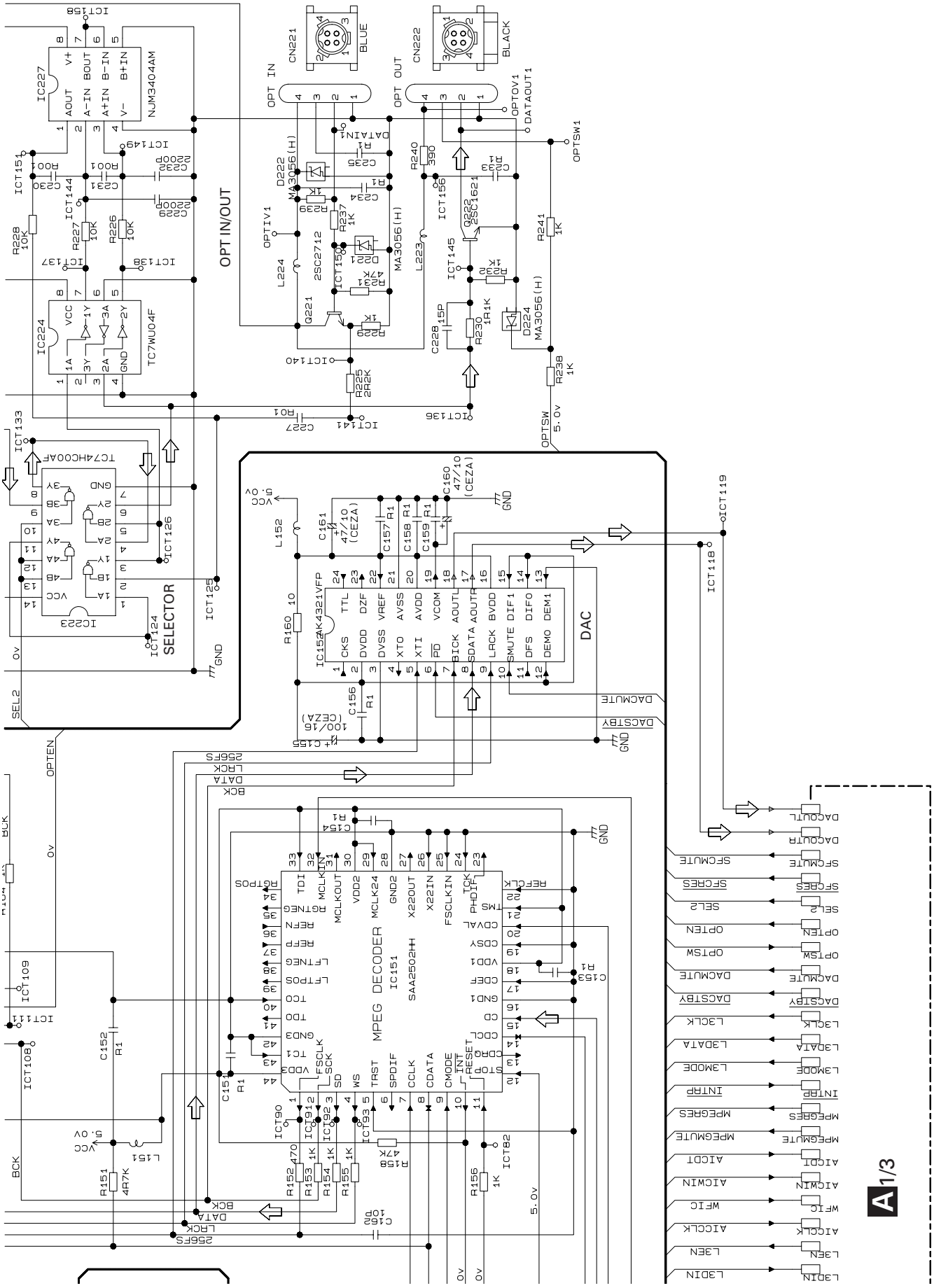
A-a A-b


DAB DECODER
IC102
SAA3500
AD CONVERTER
IC101
MN6577H
A2/3
RF SECTION
24.576MHz
8.192MHz
ADCLK1
2NDIF
IFGND
NULL


A-a
A-b
3.3V to 5V
LEVEL TRANSITION
5V to 3.3V
LEVEL TRANSITION
CLOCK CONTROL
CLOCK CONTROL
VCXO
24.576MHz
IC181
TC74HCT541AF
IC182
TC7W00FU
IC183
TC74LVX244FT
IC184
TC7S00F
IC185
TC7W74FU
X181
CWX256A
L3CLK
L3DATA
L3MODE
INTRP
MPEGRES
MPEGMUTE
L3EN
L3DIN
ICRES
PWMOUT
L3CLK
L3DATA
MCLK
SOC
SOD1
SOV1
SOD2
SOV2
CFIC
FSI
OSC1
CMODE
CCLK
RES
AICDT
AICWIN
WFIC
AICCLK
GND
VCC
3.3v
5.0v

A-a A-b

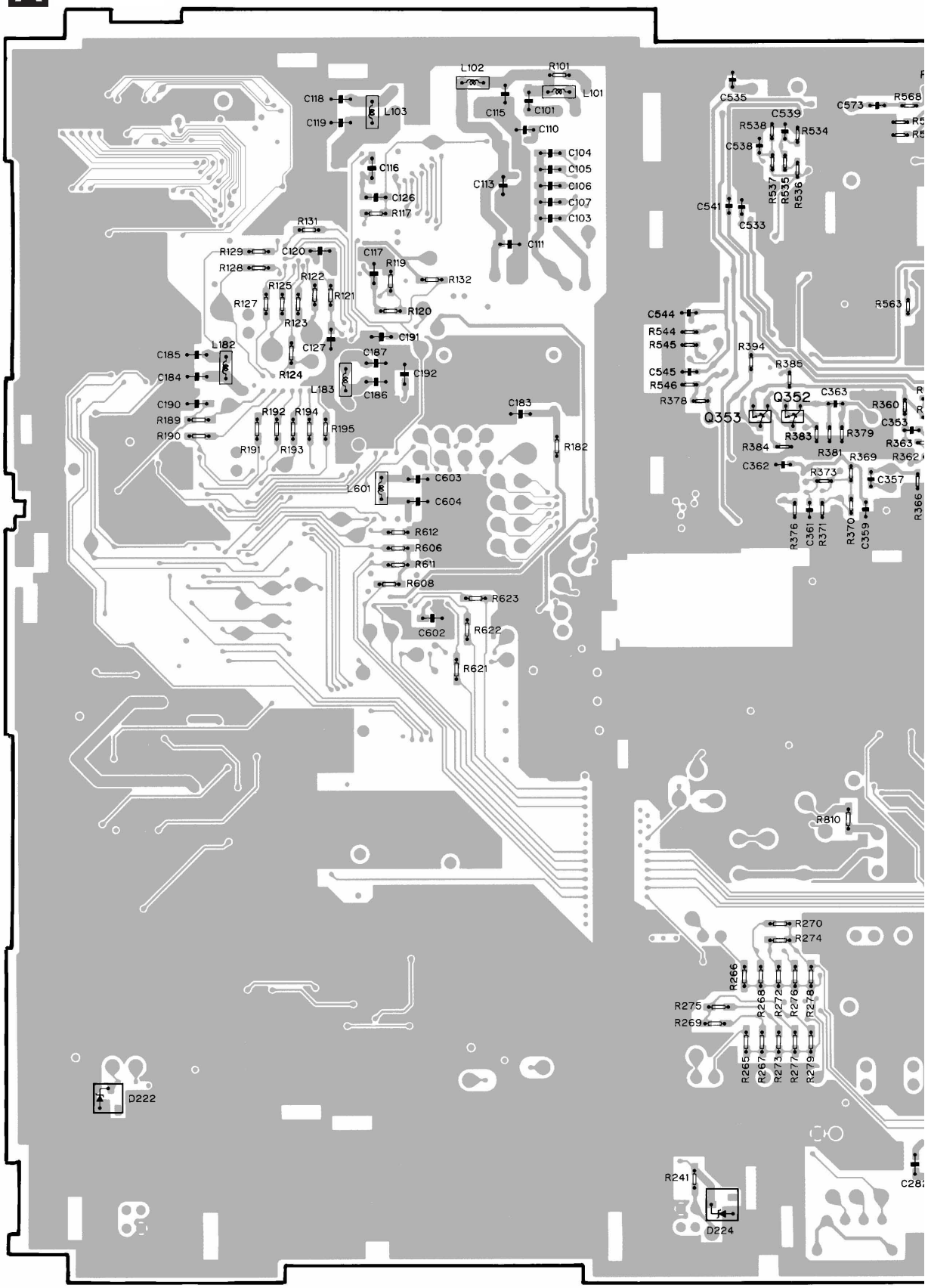

DIGITAL INTERFACE TRANSMITER
48/44.1kHz CONVERSION
SELECTOR
IC225 SM5844AF
IC226 TC9271F
IC221 TC74HC74AF
IC222 TC7WU04F
IC153 TC74HC126AF
IC103 IC104 (M5M51008BFP7OVL) GGC1303
X221 CSS1088 11.2896MHz
DATA
256FS
BCK
LRCK
SFCMUTE
SFCRES
SEL2
OPTEN


OPT IN/OUT
SELECTOR
DAC
MPEG DECODER IC151 SAA2502H
A 1/3
A-a
A-b

4. PCB CONNECTION DIAGRAM

4.1 MAIN UNIT

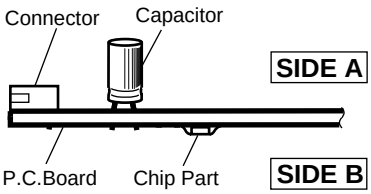
A MAIN UNIT



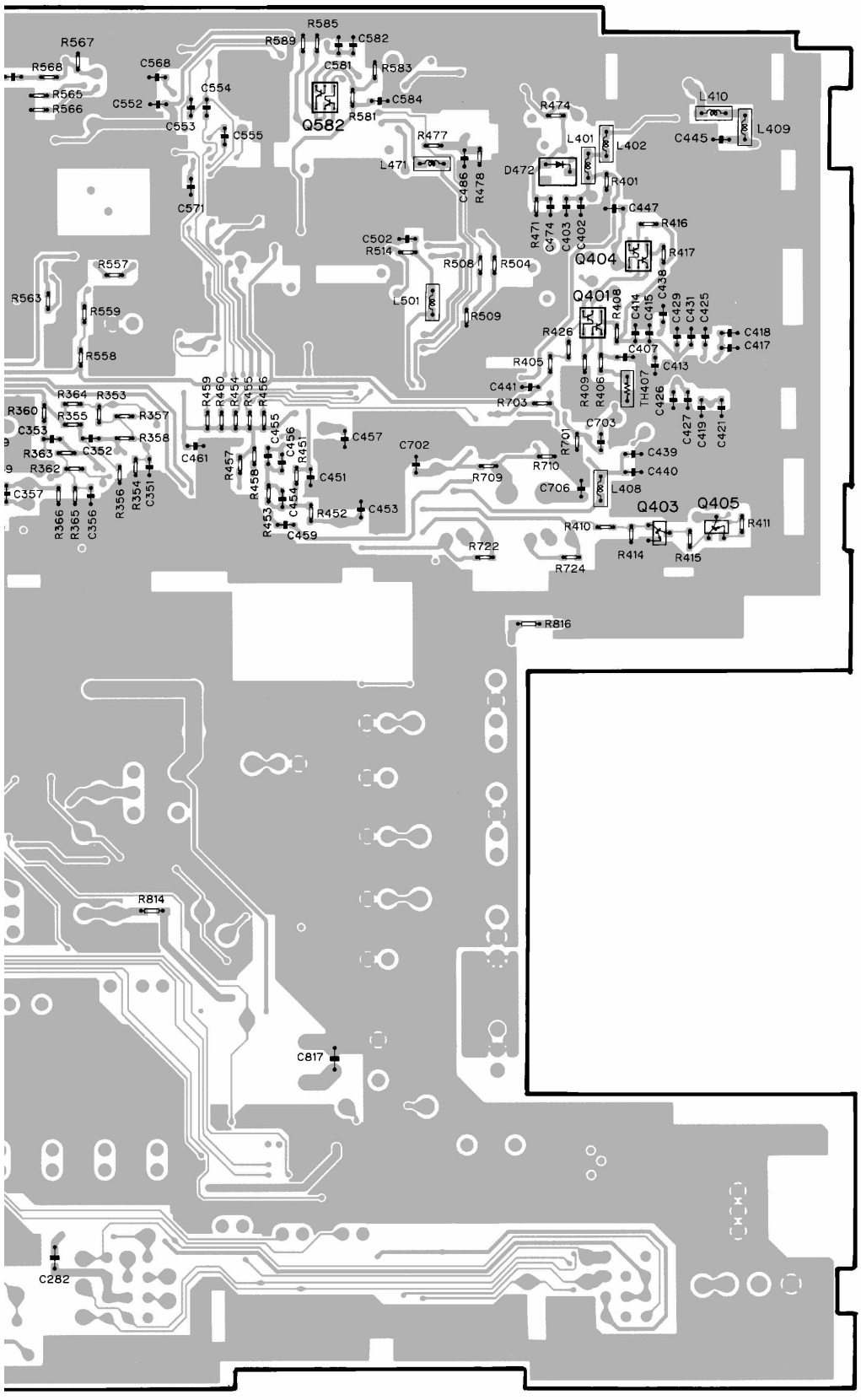
NOTE FOR PCB DIAGRAMS

1. The parts mounted on this PCB include all necessary parts for several destination. For further information for respective destinations, be sure to check with the schematic diagram.

2. Viewpoint of PCB diagrams



SIDE A



IC. Q

Q582

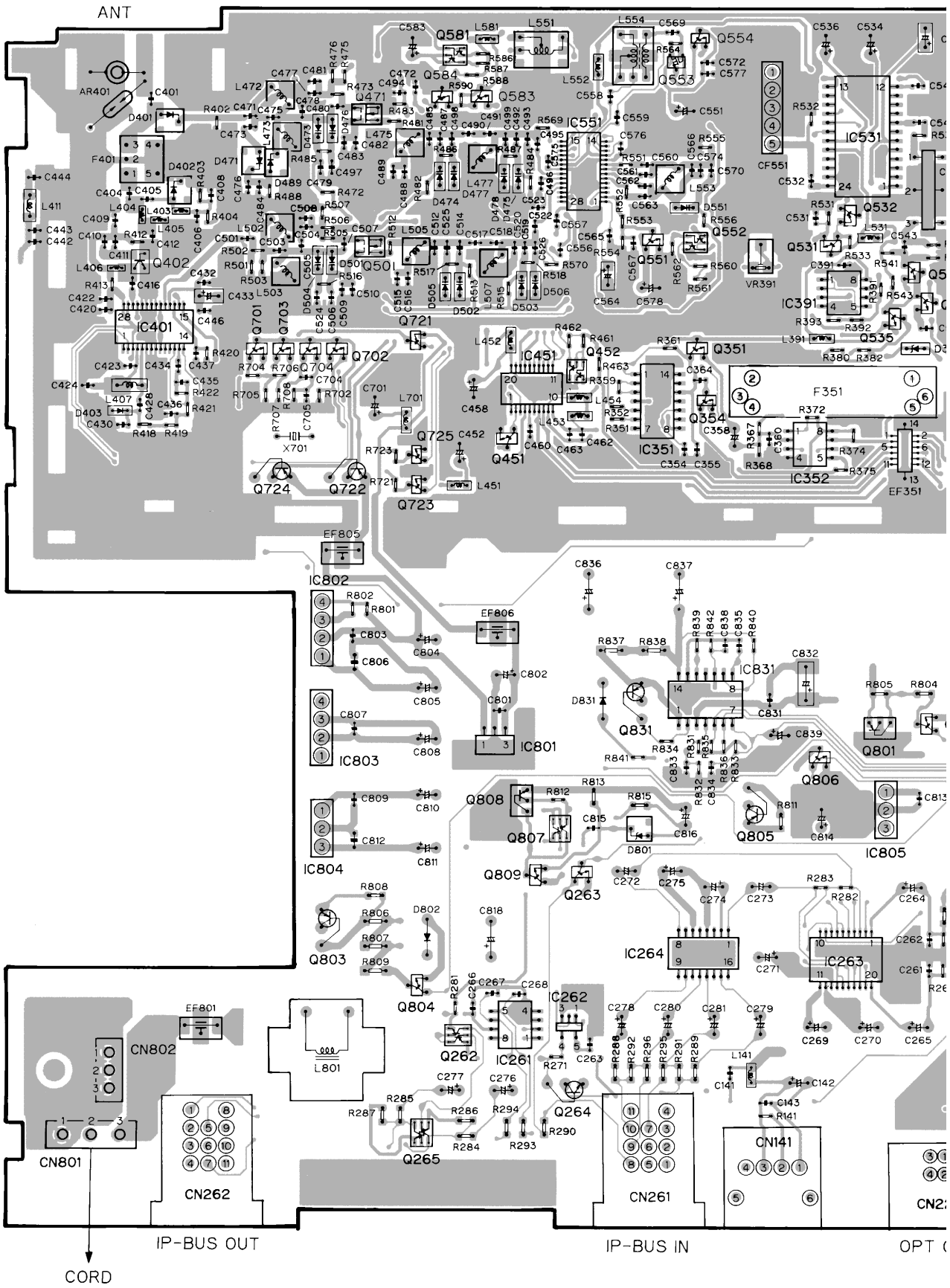
Q404

Q401

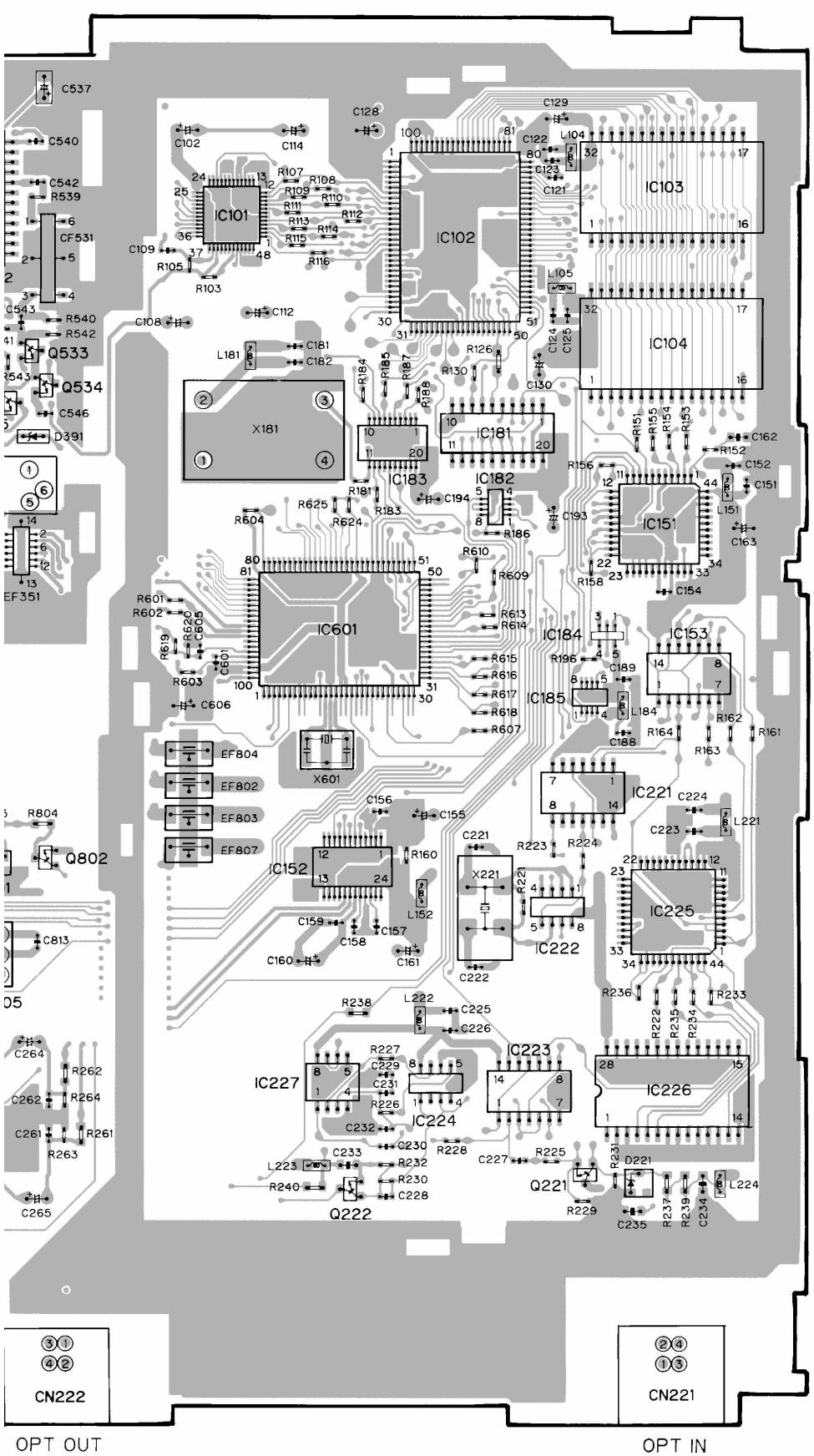
Q353 Q352

Q403 Q405

A MAIN UNIT


ANT
IC401
IC451
IC351
IC352
IC531
IC391
IC802
IC803
IC804
IC801
IC831
IC805
IC264
IC263
IC262
IC261
Q581
Q584
Q583
Q471
Q554
Q553
Q532
Q531
Q552
Q551
Q402
Q501
Q721
Q701
Q703
Q702
Q704
Q452
Q351
Q354
Q451
Q725
Q724
Q722
Q723
Q535
Q831
Q801
Q806
Q808
Q807
Q805
Q809
Q263
Q803
Q804
Q262
Q264
Q265
F351
EF805
EF806
EF801
EF351
CN802
CN801
CN262
CN261
CN141
L801
X701
IP-BUS OUT
IP-BUS IN
CORD

SIDE B



ADJ	IC, Q
	Q554
	Q581 Q553
	Q584 Q583
L473	Q471 IC531 IC103
L475	
L477	IC101 IC102
L553	IC551
	Q532
L503	Q551 Q552 Q531
L505	Q501 IC104
L507	Q402 Q533
	IC391 Q534
	Q535
	IC401 Q721
	IC183 IC181
	Q701 Q703
	Q704 Q702 Q351
	Q452
	IC351 Q354 IC151
	Q451 IC352
	Q725
	Q724 Q722 Q723
	IC601 IC184
	IC153
	IC185
	IC221
	Q831 IC831
	Q801 Q802 IC152
	IC803 Q806
	IC801 IC222 IC225
	Q808 Q805 IC805
	IC804 Q807
	Q809 Q263
	IC227 IC224 IC223
	IC226
	Q803 IC264 IC263
	Q804 Q221
	IC261 IC262 Q222
	Q262
	Q264
	Q265

5. ELECTRICAL PARTS LIST

NOTE:

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

Chip Resistor

RS1/○S○○○J,RS1/○○S○○○J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

A Unit Number : CWM5731
Unit Name : Main Unit

MISCELLANEOUS

=====Circuit Symbol and No.		===Part Name	Part No.
IC	101	IC	MN6577H
IC	102	IC	SAA3500
IC	103	(M5M51008BFP85VLL)	GGC1312
IC	104	(M5M51008BFP85VLL)	GGC1312
IC	151	IC	SAA2502H
IC	152	IC	AK4321VFP
IC	153	IC	TC74HC126AF
IC	181	IC	TC74HCT541AF
IC	182	IC	TC7W00FU
IC	183	IC	TC74LVX244FT
IC	184	IC	TC7S00F
IC	185	IC	TC7W74FU
IC	221	IC	TC74HC74AF
IC	222	IC	TC7WU04F
IC	223	IC	TC74HC00AF
IC	224	IC	TC7WU04F
IC	225	IC	SM5844AF
IC	226	IC	TC9271F
IC	227	IC	NJM3404AM
IC	261	IC	HA12187FP
IC	262	IC	TC4S11F
IC	263	IC	BA3131FS
IC	264	IC	TA2050F
IC	351	IC	NJM1496M
IC	352	IC	UPC277G2
IC	391	IC	NJM2904M
IC	401	IC	U2730B-BFS
IC	451	IC	U2733B-CFS
IC	531	IC	U2759B-AFL
IC	551	IC	U2750B-BFS
IC	601	IC	PD5440A
IC	801	IC	TA78L05F
IC	802	IC	PQ30RV1
IC	803	IC	PQ3RF23
IC	804	IC	NJM7805FA
IC	805	IC	M5278L05
IC	831	IC	PAJ002A
Q	221	Transistor	2SC2712
Q	222	Transistor	2SC1621
Q	262	Transistor	IMD3A
Q	263	Transistor	DTC114YK
Q	264	Transistor	2SD1859
Q	265	Transistor	IMH3A
Q	351	Transistor	2SC2712
Q	352	Transistor	2SC2712
Q	353	Transistor	2SC2712
Q	354	Transistor	DTC124EU
Q	401	Transistor	IMX2
Q	402		BFP420
Q	403	Transistor	2SC4116

=====Circuit Symbol and No.		===Part Name	Part No.
Q	404	Transistor	IMT2A
Q	405	Transistor	DTA143XU
Q	451	Transistor	2SC2712
Q	452	Transistor	IMH6A
Q	471	Transistor	3SK223
Q	501	Transistor	3SK223
Q	531	Transistor	2SC2712
Q	532	Transistor	2SA1162
Q	533	Transistor	2SC2712
Q	534	Transistor	2SC2712
Q	535	Transistor	2SC2712
Q	551	Transistor	2SC2712
Q	552	Transistor	IMT2A
Q	553	Transistor	2SK1067
Q	554	Transistor	2SC4099
Q	581	Transistor	IMT2A
Q	582	Transistor	IMX2
Q	583	Transistor	2SC2712
Q	584	Transistor	2SA1162
Q	701	Transistor	2SC2712
Q	702	Transistor	2SC2712
Q	703	Transistor	2SC2712
Q	704	Transistor	2SC2712
Q	721	Transistor	DTA143XU
Q	722	Transistor	2SB1238
Q	723	Transistor	DTC124EU
Q	724	Transistor	2SB1238
Q	725	Transistor	DTC124EU
Q	801	Transistor	2SA1766
Q	802	Transistor	DTC114EK
Q	803	Transistor	2SB945
Q	804	Transistor	DTC143EK
Q	805	Transistor	2SB1238
Q	806	Transistor	UN2214
Q	807	Transistor	IMD3A
Q	808	Transistor	2SC3651
Q	809	Transistor	2SC3295
Q	831	Transistor	2SB1238
D	221	Diode	MA3056(H)
D	222	Diode	MA3056(H)
D	224	Diode	MA3056(H)
D	391	Diode	MA8051(L)
D	401	Diode	1SV128A
D	402	Diode	1SV128A
D	403	Diode	BBY52-03W
D	471	Diode	1SV128A
D	472	Diode	1SV128A
D	473	Diode	KV1841E
D	474	Diode	KV1841E
D	475	Diode	KV1841E
D	476	Diode	KV1841E
D	477	Diode	KV1841E
D	478	Diode	KV1841E
D	489	Diode	1SV128A
D	501	Diode	KV1841E

=====Circuit Symbol and No.		===Part Name	Part No.
D	502	Diode	KV1841E
D	503	Diode	KV1841E
D	504	Diode	KV1841E
D	505	Diode	KV1841E
D	506	Diode	KV1841E
D	551	Diode	KV1841E
D	801	Diode	MA3056(H)
D	802	Diode	ERA15-02VH
D	831	Diode	ERA15-02VH
L	101	Inductor	CTF1295
L	102	Inductor	CTF1295
L	103	Inductor	CTF1295
L	104	Inductor	CTF1295
L	105	Inductor	CTF1295
L	141	Inductor	CTF1295
L	151	Inductor	CTF1295
L	152	Inductor	CTF1295
L	181	Inductor	CTF1295
L	182	Inductor	CTF1295
L	183	Inductor	CTF1295
L	184	Inductor	CTF1295
L	221	Inductor	CTF1295
L	222	Inductor	CTF1295
L	223	Inductor	CTF1295
L	224	Inductor	CTF1295
L	391	Inductor	CTF1295
L	401	Inductor	LCYBR27J2125
L	402	Inductor	LCYBR27J2125
L	403	Inductor	LCYB15NJ1608
L	404	Inductor	LCYB8N2K1608
L	406	Inductor	LCYB3N3K1608
L	407	Coil	CTX1067
L	408	Inductor	CTF1295
L	409	Inductor	LCYBR27J2125
L	410	Inductor	LCYBR27J2125
L	411	Inductor	LCTA100J3225
L	451	Inductor	CTF1295
L	452	Inductor	CTF1295
L	453	Inductor	LCYB47NJ2125
L	454	Inductor	LCYB47NJ2125
L	471	Inductor	CTF1295
L	472	Coil	CTJ1003
L	473	Coil	CTJ1004
L	475	Coil	CTJ1005
L	477	Coil	CTJ1005
L	501	Inductor	CTF1295
L	502	Coil	CTJ1003
L	503	Coil	CTJ1004
L	505	Coil	CTJ1005
L	507	Coil	CTJ1005
L	531	Inductor	CTF1295
L	551	Coil	CTE1135
L	552	Inductor	CTF1295
L	553	Coil	CTJ1006
L	554	Coil	CTE1136
L	581	Inductor	CTF1295
L	601	Inductor	CTF1295
L	701	Inductor	CTF1295
L	801	Choke Coil 1.4mH	CTH1129
TH	407	Thermistor	TN20-3E681K
CF	531	Filter	CTF1447
CF	551	SAW Filter	CTF1450
X	181	Resonator 24.576MHz	CWX2266
X	221	Crystal Resonator 11.2896MHz	CSS1088
X	601	Resonator 10.00MHz	CSS1428
X	701	Resonator 18.432MHz	CSS1440
VR	391	Semi-fixed 10kΩ(B)	CCP1181
F	401	Filter	CTF1452
F	351	Filter	CTF1456
EF	351		CCG1086
EF	801		CCG1051
EF	802		CCG1051
EF	803		CCG1051
EF	804		CCG1051
EF	805		CCG1051
EF	806		CCG1051
EF	807		CCG1051
AR	401		DSP-141N

RESISTORS

R	101		RS1/10S4R7J
R	103		RS1/16S183J
R	105		RS1/16S123J
R	107		RS1/16S471J
R	108		RS1/16S471J
R	109		RS1/16S471J
R	110		RS1/16S471J
R	111		RS1/16S471J
R	112		RS1/16S471J
R	113		RS1/16S471J
R	114		RS1/16S471J
R	115		RS1/16S471J
R	116		RS1/16S471J
R	117		RS1/10S471J
R	120		RS1/10S473J
R	121		RS1/10S101J
R	122		RS1/10S102J
R	123		RS1/10S102J
R	124		RS1/10S102J
R	125		RS1/10S102J
R	126		RS1/10S102J
R	127		RS1/10S102J
R	128		RS1/10S102J
R	129		RS1/10S102J
R	130		RS1/16S102J
R	131		RS1/10S102J
R	132		RS1/10S0R0J
R	141		RS1/16S822J
R	151		RS1/16S472J
R	152		RS1/16S471J
R	153		RS1/16S102J
R	154		RS1/16S102J
R	155		RS1/16S102J
R	156		RS1/16S102J
R	158		RS1/16S473J
R	160		RS1/16S100J
R	161		RS1/16S102J
R	162		RS1/16S471J
R	163		RS1/16S102J
R	164		RS1/16S102J
R	181		RS1/16S101J
R	182		RS1/10S183J
R	184		RS1/16S101J
R	185		RS1/16S102J
R	186		RS1/16S102J
R	187		RS1/16S102J
R	188		RS1/16S102J
R	189		RS1/10S101J
R	190		RS1/10S102J
R	191		RS1/10S102J

=====Circuit Symbol and No.	===Part Name	Part No.
R 192		RS1/10S102J
R 193		RS1/10S102J
R 194		RS1/10S102J
R 195		RS1/10S102J
R 196		RS1/16S102J
R 221		RS1/16S105J
R 222		RS1/16S471J
R 223		RS1/16S102J
R 224		RS1/16S102J
R 225		RS1/16S222J
R 226		RS1/16S103J
R 227		RS1/16S103J
R 228		RS1/16S103J
R 229		RS1/16S102J
R 230		RS1/16S112J
R 231		RS1/16S473J
R 232		RS1/16S102J
R 233		RS1/16S102J
R 234		RS1/16S102J
R 235		RS1/16S102J
R 236		RS1/16S0R0J
R 237		RS1/10S102J
R 238		RS1/10S102J
R 239		RS1/10S102J
R 240		RS1/10S391J
R 241		RS1/10S102J
R 261		RS1/10S221J
R 262		RS1/10S221J
R 265		RS1/10S473J
R 266		RS1/10S473J
R 267		RS1/10S473J
R 268		RS1/10S473J
R 269		RS1/10S562J
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R 283		RS1/16S473J
R 284		RS1/10S102J
R 285		RS1/10S102J
R 286		RS1/10S223J
R 287		RS1/10S223J
R 288		RS1/10S102J
R 289		RS1/10S102J
R 290		RS1/10S123J
R 291		RS1/10S223J
R 292		RS1/10S223J
R 293		RS1/10S101J
R 294		RS1/10S101J
R 295		RS1/10S181J
R 296		RS1/10S181J
R 351		RS1/16S103J
R 352		RS1/16S223J
R 353		RS1/16S183J
R 354		RS1/16S472J
R 355		RS1/16S101J
R 357		RS1/16S222J

=====Circuit Symbol and No.	===Part Name	Part No.
R 358		RS1/16S222J
R 359		RS1/16S101J
R 360		RS1/16S0R0J
R 361		RS1/16S223J
R 362		RS1/16S222J
R 363		RS1/16S222J
R 364		RS1/16S183J
R 365		RS1/16S682J
R 366		RS1/16S102J
R 367		RS1/16S103J
R 368		RS1/16S104J
R 369		RS1/16S223J
R 370		RS1/16S183J
R 371		RS1/16S473J
R 372		RS1/16S123J
R 373		RS1/16S104J
R 374		RS1/16S103J
R 375		RS1/16S223J
R 376		RS1/16S223J
R 378		RS1/16S102J
R 379		RS1/16S102J
R 380		RS1/16S333J
R 381		RS1/16S123J
R 382		RS1/16S562J
R 383		RS1/16S152J
R 384		RS1/16S102J
R 392		RS1/16S103J
R 393		RS1/16S0R0J
R 394		RS1/16S222J
R 401		RS1/16S103J
R 402		RS1/16S561J
R 403		RS1/16S103J
R 404		RS1/16S472J
R 405		RS1/16S222J
R 406		RS1/16S682J
R 408		RS1/16S471J
R 409		RS1/16S102J
R 410		RS1/16S473J
R 411		RS1/16S102J
R 412		RS1/16S223J
R 413		RS1/16S122J
R 414		RS1/16S273J
R 415		RS1/16S473J
R 416		RS1/16S101J
R 417		RS1/16S562J
R 418		RS1/16S473J
R 419		RS1/16S0R0J
R 420		RS1/16S123J
R 421		RS1/16S102J
R 422		RS1/16S104J
R 426		RS1/16S221J
R 451		RS1/16S102J
R 452		RS1/16S102J
R 453		RS1/16S333J
R 454		RS1/16S472J
R 455		RS1/16S472J
R 456		RS1/16S472J
R 457		RS1/16S472J
R 458		RS1/16S472J
R 459		RS1/16S472J
R 460		RS1/16S472J
R 461		RS1/16S472J
R 462		RS1/16S103J
R 463		RS1/16S103J
R 471		RS1/16S103J

=====Circuit Symbol and No.	===Part Name	Part No.
R 472		RS1/16S473J
R 473		RS1/16S473J
R 474		RS1/16S101J
R 475		RS1/16S153J
R 476		RS1/16S332J
R 477		RS1/16S184J
R 478		RS1/16S274J
R 481		RS1/16S220J
R 482		RS1/16S473J
R 483		RS1/16S271J
R 484		RS1/16S473J
R 485		RS1/16S103J
R 486		RS1/16S103J
R 487		RS1/16S103J
R 488		RS1/16S101J
R 501		RS1/16S680J
R 502		RS1/16S271J
R 503		RS1/16S680J
R 504		RS1/16S473J
R 505		RS1/16S473J
R 506		RS1/16S153J
R 507		RS1/16S332J
R 508		RS1/16S184J
R 509		RS1/16S274J
R 512		RS1/16S220J
R 513		RS1/16S473J
R 514		RS1/16S271J
R 515		RS1/16S473J
R 516		RS1/16S103J
R 517		RS1/16S103J
R 518		RS1/16S103J
R 531		RS1/16S103J
R 533		RS1/16S473J
R 534		RS1/16S333J
R 535		RS1/16S0R0J
R 536		RS1/16S473J
R 537		RS1/16S333J
R 538		RS1/16S333J
R 539		RS1/16S102J
R 540		RS1/16S102J
R 541		RS1/16S333J
R 542		RS1/16S123J
R 543		RS1/16S302J
R 544		RS1/16S152J
R 545		RS1/16S102J
R 546		RS1/16S472J
R 551		RS1/16S271J
R 552		RS1/16S271J
R 553		RS1/16S103J
R 554		RS1/16S153J
R 555		RS1/16S473J
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R 557		RS1/16S472J
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R 559		RS1/16S392J
R 560		RS1/16S562J
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R 562		RS1/16S332J
R 563		RS1/16S103J
R 564		RS1/16S104J
R 565		RS1/16S104J
R 566		RS1/16S472J
R 567		RS1/16S471J
R 568		RS1/16S270J
R 569		RS1/16S102J

=====Circuit Symbol and No.	===Part Name	Part No.
R 570		RS1/16S102J
R 581		RS1/16S272J
R 583		RS1/16S681J
R 585		RS1/16S152J
R 586		RS1/16S151J
R 587		RS1/16S682J
R 588		RS1/16S471J
R 589		RS1/16S103J
R 590		RS1/16S473J
R 601		RS1/16S470J
R 602		RS1/16S470J
R 603		RS1/16S470J
R 604		RS1/16S473J
R 606		RS1/10S473J
R 607		RS1/16S102J
R 608		RS1/10S472J
R 609		RS1/16S102J
R 610		RS1/16S102J
R 611		RS1/10S473J
R 612		RS1/10S473J
R 613		RS1/16S102J
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R 615		RS1/16S102J
R 616		RS1/16S102J
R 617		RS1/16S102J
R 618		RS1/16S101J
R 619		RS1/16S473J
R 620		RS1/16S473J
R 621		RS1/10S102J
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R 707		RS1/16S103J
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R 709		RS1/16S472J
R 710		RS1/16S472J
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R 722		RS1/16S103J
R 723		RS1/16S222J
R 724		RS1/16S103J
R 801		RS1/16S1622F
R 802		RS1/16S2801F
R 804		RS1/10S472J
R 805		RS1/10S473J
R 806		RS1/8S221J
R 807		RS1/8S221J
R 808		RS1/10S103J
R 809		RS1/8S221J
R 810		RS1/10S272J
R 811		RS1/10S473J
R 812		RS1/16S391J
R 813		RS1/10S562J
R 814		RS1/10S361J
R 815		RS1/10S102J
R 816		RS1/8S100J
R 831		RS1/16S104J
R 832		RS1/16S104J
R 833		RS1/16S223J
R 834		RS1/16S102J

=====Circuit Symbol and No.	===Part Name	Part No.
R 835		RS1/16S104J
R 836		RS1/16S104J
R 837		RS1/8S2R0J
R 838		RS1/8S2R0J
R 839		RS1/16S103J
R 840		RS1/16S104J
R 841		RS1/16S204J
R 842		RS1/16S104J
CAPACITORS		
C 101		CKSQYB104K16
C 102		CEAS470M10
C 103		CKSQYB104K16
C 104		CKSQYB104K16
C 105		CKSQYB104K16
C 106		CKSQYB104K16
C 107		CKSQYB104K16
C 108		CEAS470M10
C 109		CKSRYB104K16
C 110		CKSQYB104K16
C 111		CKSQYB104K16
C 112		CEAS470M10
C 113		CKSQYB104K16
C 114		CEAS470M10
C 115		CKSQYB104K16
C 116		CKSQYB104K16
C 117		CKSQYB104K16
C 118		CKSQYB104K16
C 119		CKSQYB104K16
C 120		CKSQYB104K16
C 121		CKSRYB104K16
C 122		CKSRYB104K16
C 123		CKSRYB104K16
C 124		CKSRYB104K16
C 125		CKSRYB104K16
C 126		CCSQCH150J50
C 127		CCSQCH150J50
C 129		CEJA220M6R3
C 130		CEJA220M6R3
C 141		CKSRYB104K16
C 142		CEAS470M10
C 143		CKSRYB104K16
C 151		CKSRYB104K16
C 152		CKSRYB104K16
C 153		CKSRYB104K16
C 154		CKSRYB104K16
C 155		CEZA100M16
C 156		CKSRYB104K16
C 157		CKSRYB104K16
C 158		CKSRYB104K16
C 159		CKSRYB104K16
C 160		CEZA470M10
C 161		CEZA470M10
C 162		CCSQCH100J50
C 181		CKSRYB104K16
C 182		CKSRYB104K16
C 183		CKSQYB224K16
C 184		CKSQYB104K16
C 185		CKSQYB104K16
C 186		CKSQYB104K16
C 187		CKSQYB104K16
C 188		CKSRYB104K16
C 189		CKSRYB104K16
C 190		CCSQCH150J50
C 191		CCSQCH150J50

=====Circuit Symbol and No.	===Part Name	Part No.
C 192		CCSQCH150J50
C 221		CCSRCH150J50
C 222		CCSRCH150J50
C 223		CKSRYB104K16
C 224		CKSRYB104K16
C 225		CKSRYB104K16
C 226		CKSRYB104K16
C 227		CKSRYB103K25
C 228		CCSRCH150J50
C 229		CKSRYB222K50
C 230		CKSRYB102K50
C 231		CKSRYB102K50
C 232		CKSRYB222K50
C 233		CKSQYB104K16
C 234		CKSQYB104K16
C 235		CKSQYB104K16
C 261		CCSRCH221J50
C 262		CCSRCH221J50
C 263		CKSRYB103K25
C 264		CEJA100M16
C 265		CEJA100M16
C 266		CKSRYB103K25
C 267		CKSRYB102K50
C 268		CKSRYB102K50
C 269		CEZA470M10
C 270		CEZA220M10
C 271		CEZA101M10
C 272		CEJANP100M10
C 273		CEJANP100M10
C 274		CEJA220M6R3
C 275		CEJA220M6R3
C 276		CEAS330M10
C 277		CEAS330M10
C 278		CEJA1R0M50
C 279		CEJA1R0M50
C 280		CEJA1R0M50
C 281		CEJA1R0M50
C 282		CKSQYB103K25
C 351		CKSRYB103K25
C 352		CKSRYB103K25
C 353		CKSRYB103K25
C 354		CKSRYB103K25
C 355		CKSRYB102K50
C 356		CKSRYB103K25
C 357		CKSRYB103K25
C 358		CEJANP2R2M35
C 359		CKSRYB103K25
C 360		CKSRYB103K25
C 362		CKSRYB103K25
C 363		CKSRYB104K16
C 364		CKSRYB152K50
C 391		CKSRYB103K25
C 401		CCSRCH101J50
C 402		CCSRCH101J50
C 403		CKSRYB102K50
C 404		CCSRCK2R0C50
C 405		CCSRCH101J50
C 406		CCSRCH101J50
C 407		CCSRCH101J50
C 408		CCSRCH102J25
C 409		CCSRCH101J50
C 412		CCSRCH4R0C50
C 416		CCSRCH100D50
C 417		CCSRCH101J50
C 418		CKSRYB102K50

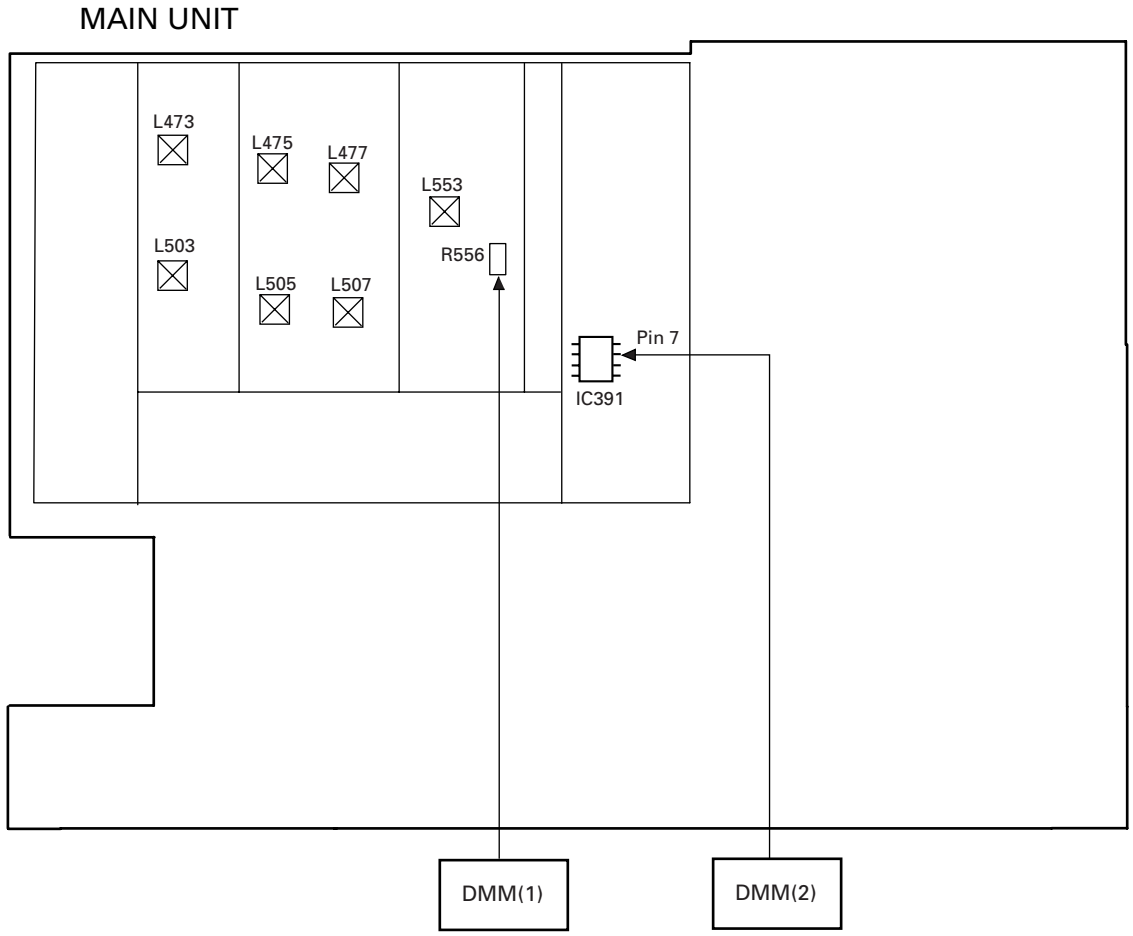
=====Circuit Symbol and No.	===Part Name	Part No.
C 419		CKSRYB102K50
C 420		CCSRCH101J50
C 421		CCSRCH101J50
C 422		CKSRYB102K50
C 423		CKSRYB102K50
C 424		CCSRCH330J50
C 425		CCSRCH101J50
C 426		CCSRCH101J50
C 427		CKSRYB102K50
C 428		CCSRCJ3R0C50
C 429		CKSRYB102K50
C 430		CCSRCK1R0C50
C 431		CCSRCH101J50
C 432		CCSRCH101J50
C 433		CSZS4R7M10
C 434		CKSRYB681K50
C 435		CCSRCH680J50
C 436		CKSRYB332K50
C 437		CCSRCH101J50
C 438		CCSRCH101J50
C 439		CKSRYB102K50
C 440		CCSRCH101J50
C 442		CCSRCH101J50
C 443		CKSRYB103K25
C 444		CCSRCH101J50
C 445		CKSRYB103K25
C 446		CCSRCH101J50
C 447		CCSQCH101J50
C 451		CKSRYB103K25
C 452		CEAS101M10
C 453		CKSRYB473K16
C 454		CKSRYB102K50
C 456		CKSRYB104K16
C 457		CKSRYB103K25
C 458		CEAS101M10
C 459		CKSRYB103K25
C 460		CKSRYB103K25
C 461		CKSRYB103K25
C 462		CCSRCH181J50
C 471		CKSRYB102K50
C 472		CKSRYB102K50
C 473		CKSRYB102K50
C 474		CKSRYB102K50
C 475		CCSRCH4R0C50
C 476		CCSRCH101J50
C 477		CKSRYB102K50
C 479		CCSRCH121J50
C 480		CCSRCH101J50
C 481		CKSRYB102K50
C 482		CKSRYB104K16
C 483		CCSRCH101J50
C 484		CKSRYB103K25
C 485		CCSRCK1R0C50
C 486		CCSRCH221J50
C 487		CCSRCH820J50
C 488		CCSRCH101J50
C 489		CKSRYB102K50
C 490		CCSRCK1R0C50
C 491		CCSRCK1R0C50
C 492		CCSRCH820J50
C 493		CCSRCK2R0C50
C 494		CKSRYB102K50
C 495		CKSRYB102K50
C 496		CKSRYB102K50
C 497		CCSRCH121J50

=====Circuit Symbol and No.	===Part Name	Part No.
C 498		CCSRCH820J50
C 499		CCSRCH820J50
C 501		CKSRYB102K50
C 502		CKSRYB102K50
C 503		CCSRCH4R0C50
C 504		CKSRYB102K50
C 506		CCSRCH101J50
C 507		CCSRCH101J50
C 508		CKSRYB102K50
C 509		CKSRYB104K16
C 510		CCSRCH101J50
C 512		CCSRCK1R0C50
C 514		CCSRCH820J50
C 515		CCSRCH101J50
C 516		CKSRYB102K50
C 517		CCSRCK1R0C50
C 518		CCSRCK1R0C50
C 519		CCSRCH820J50
C 520		CCSRCK1R0C50
C 522		CKSRYB102K50
C 523		CKSRYB102K50
C 524		CCSRCH101J50
C 525		CCSRCH820J50
C 526		CCSRCH820J50
C 531		CKSRYB103K25
C 532		CKSRYB103K25
C 533		CKSRYB103K25
C 534		CEAS220M16
C 535		CKSRYB103K25
C 536		CEJA4R7M35
C 537		CSZS1R0M16
C 538		CKSRYB104K16
C 539		CKSRYB104K16
C 540		CKSRYB103K25
C 541		CKSRYB103K25
C 542		CKSRYB104K16
C 543		CKSRYB104K16
C 544		CKSRYB102K50
C 545		CKSRYB104K16
C 546		CKSRYB104K16
C 551		CEAS470M10
C 552		CKSRYB104K16
C 553		CCSRCH330J50
C 554		CKSRYB103K25
C 555		CKSRYB103K25
C 556		CKSRYB102K50
C 557		CKSRYB102K50
C 558		CKSRYB103K25
C 559		CKSRYB103K25
C 560		CCSRCJ3R0C50
C 561		CCSRCK2R0C50
C 562		CCSRCJ3R0C50
C 563		CCSRCK2R0C50
C 564		CSZS3R3M10
C 565		CKSRYB102K50
C 566		CCSRCK2R0C50
C 567		CKSRYB102K50
C 568		CKSRYB103K25
C 569		CKSRYB103K25
C 570		CCSRCH390J50
C 571		CKSRYB103K25
C 572		CKSRYB103K25
C 573		CKSRYB103K25
C 575		CCSRCH221J50
C 576		CKSRYB102K50

=====Circuit Symbol and No.	===Part Name	Part No.
C 577		CKSRYB103K25
C 578		CEJA4R7M35
C 581		CKSRYB104K16
C 582		CKSRYB103K25
C 583		CEJA100M16
C 601		CKSRYB104K16
C 602		CKSQYB104K16
C 603		CKSQYB104K16
C 604		CKSQYB104K16
C 605		CKSRYB103K25
C 606		CEJA100M16
C 701		CEJA100M16
C 702		CKSRYB103K25
C 703		CKSRYB103K25
C 704		CCSRCH180J50
C 705		CCSRCH180J50
C 706		CCSRCH270J50
C 801		CKSRYB104K16
C 802		CEAS220M16
C 803		CKSRYB104K16
C 804		CEAS220M16
C 805		CEAS220M16
C 806		CKSQYB104K25
C 807		CKSRYB104K16
C 808		CEAS220M10
C 809		CKSRYB104K16
C 810		CEAS220M10
C 811		CEAS220M16
C 812		CKSQYB104K25
C 813		CKSRYB104K16
C 814		CEJA100M16
C 815		CKSRYB104K16
C 816		CEAS220M16
C 817		CKSQYB103K25
C 818		CEZA471M16
C 831		CKSRYB104K16
C 832		CSZST220M16
C 833		CKSRYB103K25
C 834		CKSRYB103K25
C 835		CKSRYB103K25
C 836		CEAS471M16
C 837		CEAS471M16
C 838		CKSRYB223K25
C 839		CEJA2R2M50

6. ADJUSTMENT

● **Connection Diagram**



Equipment required:

- Head unit
- SG: Capable of outputting sine waves up to 1.5 GHz (no modulation function is required)
- DMM
- Adjustment stick (with flat tip)

1. VCO ADJUSTMENT
   1) Connect the GEX-P900DAB to a DC regulated power supply. Connect the head unit and the GEX-P900DAB with an IPBUS cable.
   2) Set the power to ON, and enter DAB Service mode.
   3) Set frequency to 13 F.
   4) Check R556 on the side where P1 is located (the side not in contact with D551) with DMM (1) so that VT (tuning voltage) can be measured. Adjust air-core coil (L553) so that VT is 7.00 V.
   5) Set frequency to 5 A, and confirm that VT is within the range from 1.2 to 1.7 V.

2. TRK (Tracking) ADJUSTMENT

1) Connect the GEX-P900DAB to a DC regulated power supply. Connect the head unit and the GEX-P900DAB with an IPBUS cable.
2) Connect SG to ANT input.
3) Set the power to ON, and enter DAB Service mode.
4) BAND 3 ADJUSTMENT

Set frequency to 10 A. Set SG to 209.936 MHz and 35 dBuV. Then, check SLEVEL terminal (IC 391, Pin 7) with DMM (2) so that SLEVEL voltage can be measured. Use the adjustment stick to adjust the air-core coil (L473) in front of FET to maximum SLEVEL voltage. Similarly, adjust the air-core coil (L475) behind FET, as well as the air-core coil (L477) behind L475. Repeat these adjustment steps several times to set SLEVEL voltage to maximum.

5) L-BAND ADJUSTMENT

Basic adjustment of L-Band is the same as adjustment of BAND 3. Set frequency to L12. Set SG to 1471.792 MHz and 25 dBuV.

Use the adjustment stick to adjust the air-core coil (L503) in front of FET to maximum SLEVEL voltage. Similarly, adjust the air-core coil (L505) behind FET, as well as the air-core coil (L507) behind L505. Repeat these adjustment steps several times to set SLEVEL voltage to maximum.

● Confirmation of Operation

Equipment required:

- Head unit
- RF SG: Capable of outputting DAB signals up to 1.5 GHz (IQ modulation function is required)
- DAB encoder (e.g. KENWOOD DAB-3801)

1. Confirming Operation

1) Confirming BAND 3

Set the encoder to MODE 1.

Set the receiver and RF SG as shown below. Measure the error rate (see Note) to check whether the sensitivity and maximum input of the specification are satisfied.

Receiver	RF SG
5 A	174.928 MHz
10 A	209.936 MHz
13 F	239.200 MHz

2) Confirming L-BAND

Set the encoder to MODE 2.

Set the receiver and RF SG as shown below. Measure the error rate to check whether the sensitivity and maximum input of the specification are satisfied.

Receiver	RF SG
L 1	1452.960 MHz
L12	1471.792 MHz
L23	1490.624 MHz

Note:

Error rate is evaluated at 1E-4 if the error rate after correction can be measured. To measure the error rate before correction, evaluation should be made at 5E-2.

The unit operates correctly if the specification is satisfied.

7. GENERAL INFORMATION

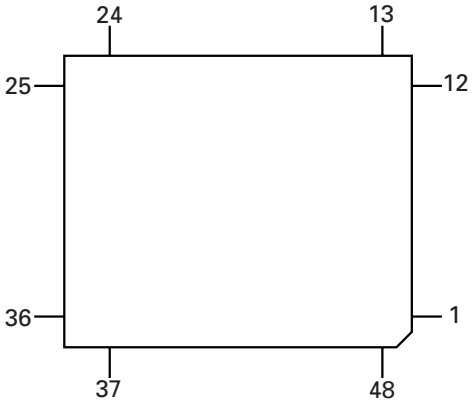
7.1 IC

MN6577H
SAA3500
GGC1312 (M5M51008BFP85VLL)
SAA2502H
AK4321VFP
TC74HC126AF
TC74HCT541AF
TC7W00FU
TC74LVX244FT
TC74HC74AF
TC7WU04F
TC74HC00AF
SM5844AF
TC9271F
NJM1496M
UPC277G2
U2730B-BFS
U2733B-CFS
U2759B-AFL
U2750B-BFS
PD5440A
PQ30RV1
PQ3RF23

● **Pin Functions (MN6577H)**

Pin No.	Pin Name	I/O	Function and Operation
1-5	D0-D4	O	Digital codes outputs D0 : LSB D9 : MSB
6	DVSS	I	Digital GND
7	DVDD	I	Digital power supply
8-12	D5-D9	O	Digital codes outputs D0 : LSB D9 : MSB
13	TEST2	I	L : Normal operation mode H : Test mode with built-in resistor
14	TEST1	I	L : Normal operation mode H : Test mode with built-in resistor
15	DVDD	I	Digital power supply
16,17	DVSS	I	Digital GND
18	DVDD	I	Digital power supply
19	NC		Not used
20	LINV	I	L : Normal output mode H : Inverted output from D8-D0 with built-in resistor
21	MINV	I	L : Normal output mode H : Inverted output from MSB(D9) with built-in resistor
22	CLK	I	Clock input Performs sampling at the trailing edge of the clock. Outputs digital codes at the leading edge of the 2.5th clock.
23	N0E	I	Digital output enable H : Digital output(D0-D9, OVF, UNDF) high-impedance L : Digital output(D0-D9, OVF, UNDF)
24	POWD	I	H : Power down mode L : Normal operation mode In power down mode, the UNDF terminal changes to "H" and other digital outputs set to "L".
25,26	AVDD	I	Analog power supply
27	AVSS	I	Analog GND
28	NC		Not used
29	VRTS	O	① When using 3.0V for VRT and 1.0V for VRB : connecting VRT to AVDD and VRBS to VRB ② When using 2.0V for VRT and 0V for VRB : connecting VRT to VRTS and VRB to AVSS
30	VRT	I	TOP side reference voltage input
31-33	VR1-VR3	I	Intermediate reference potential (capacity connection to AVSS)
34	VRB	I	Bottom side reference voltage input
35	VRBS	O	① When using 3.0V for VRT and 1.0V for VRB : connecting VRT to AVDD and VRBS to VRB ② When using 2.0V for VRT and 0V for VRB : connecting VRT to VRTS and VRB to AVSS
36,37	NC		Not used
38	AVDD	I	Analog power supply
39	VIN	I	Analog signal input
40-42	NC		Not used
43	AVSS	I	Analog GND
44	DVSS	I	Digital GND
45	DVDD	I	Digital power supply
46	UNDF	O	Under flow output
47	OVF	O	Over flow output
48	NC		Not used

*MN6577H



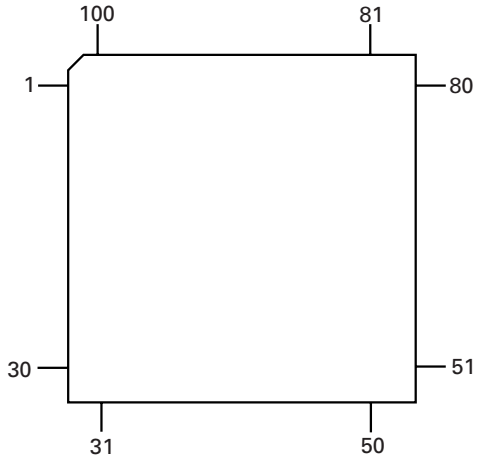
IC's marked by* are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

● **Pin Functions (SAA3500)**

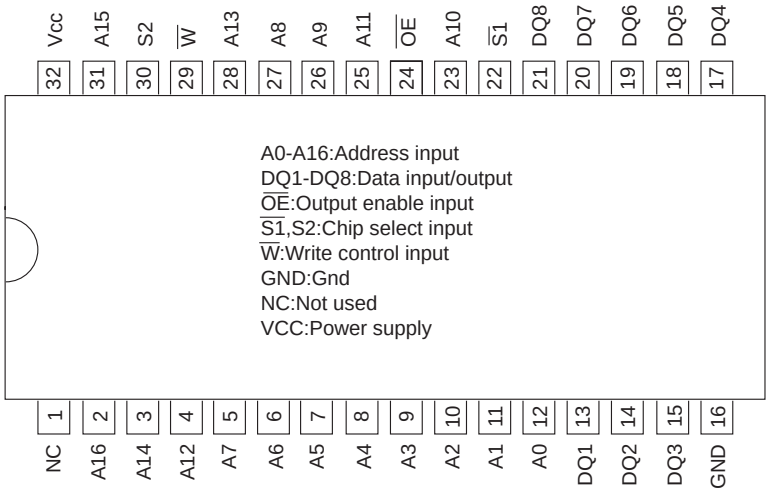
Pin No.	Pin Name	I/O	Function and Operation
1,2	NC		Connect to ground for proper operation.
3	GND1		Digital ground
4	OSC	I	System clock input 24.576 MHz
5	NC		Do not connect !
6	VDD1		Voltage supply + 3V
7	GND2		Digital ground
8-17	INP[0-9]	I	2 MHz IF of Baseband digital parallel input data (10 bits)
18	GND3		Digital ground
19	ADCLK	O	A/D clock output 8.192 MHz if BYP=high, 4.096 MHz if BYP=low.
20	IQSELECT	I	Clock signal indicating I or Q Baseband data if BYP=low. Signal for swapping I and Q data bytes if BYP=high.
21	$\overline{\text{BYPASS}}$	I	IF input stage bypass if BYP=low.
22	$\overline{\text{FSI}}$	I	Frame sync Input (low indicates DAB null symbol detection).
23	$\overline{\text{FSO}}$	O	Frame sync output (low indicates DAB null symbol position)
24	AGC LOCK		Not used
25	AGCW		Not used
26	GND4		Digital ground
27	OCLK	O	Output data clock (negative edge indicates new data)
28	VDD2		Voltage supply + 3V
29	OIQ	O	Output I or Q select signal or frame trigger (if OIQ=high)
30	$\overline{\text{OCIR}}$	I	Output select baseband if OIQ=1, CIR if OIQ=0
31	$\overline{\text{OEN}}$	I	OUT enable (if low)
32-39	OUT[0-7]	O	Baseband or channel impulse response output.
40	GND5		Digital ground
41	MCLK	O	Master clock output 24.576 MHz
42	VDD3		Voltage supply + 3V
43	REF	O	Receiver error flag (from viterbi decoder)
44-46	SOV3-1	O	Serial output valid data 3-1
47,48	SOD3,2	O	Serial output data 3,2
49	SOD1	O	Serial output data 1 (from channel decoder)

Pin No.	Pin Name	I/O	Function and Operation
50	SOC	O	Serial output clock (384 kHz continuous)
51	CFIC	O	µC interface signal indicating FIC processing
52	CMODE	I	µC interface mode input I2C or L3
53	CDATA	I/O	µC interface serial data I2C or L3 (5V compliant)
54	CCLK	I	µC interface clock input I2C or L3
55	$\overline{\text{RESET}}$	I	Chip reset input
56	SFCO	O	Simple full capacity output (direct from viterbi decoder)
57	RDC	O	Receiver data clock (6144 kHz continuous) or SFCO clock (burst)
58	$\overline{\text{RDE}}$	I	RDI output enable (if low)
59	RDO	O	Receiver data interface biphase output.
60	GND6		Digital ground
61	$\overline{\text{WR}}$	O	Write data to RAM
62-68	A[17-11]	O	Address outputs external RAM
69	RD	O	Read data from RAM
70	CS	O	Chip select
71-78	D[7-0]	I/O	Data I/O external RAM
79	VDD4		Voltage supply + 3V
80	GND7		Digital ground
81-91	A[10-0]	O	Address outputs external RAM
92	TCO	I	Connect to ground for proper operation.
93	TDO	O	Not used
94	GND8		Digital ground
95	TCK	I	Boundary scan test clock input
96	TDI	I	Boundary scan test serial input
97	TMS	I	Boundary scan test mode select input
98	TRST	I	Boundary scan test reset input
99	TCI		Not used
100	VCC		Voltage supply + 3V

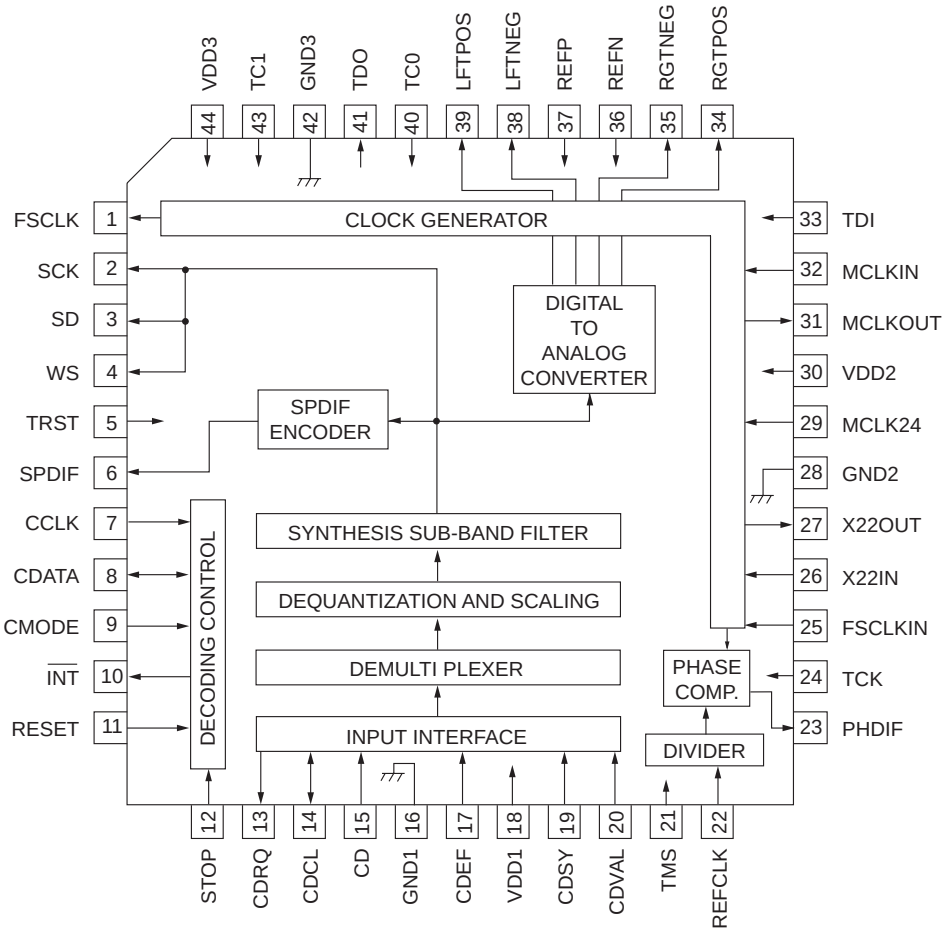
*SAA3500



*GGC1312(M5M51008BFP85VLL)



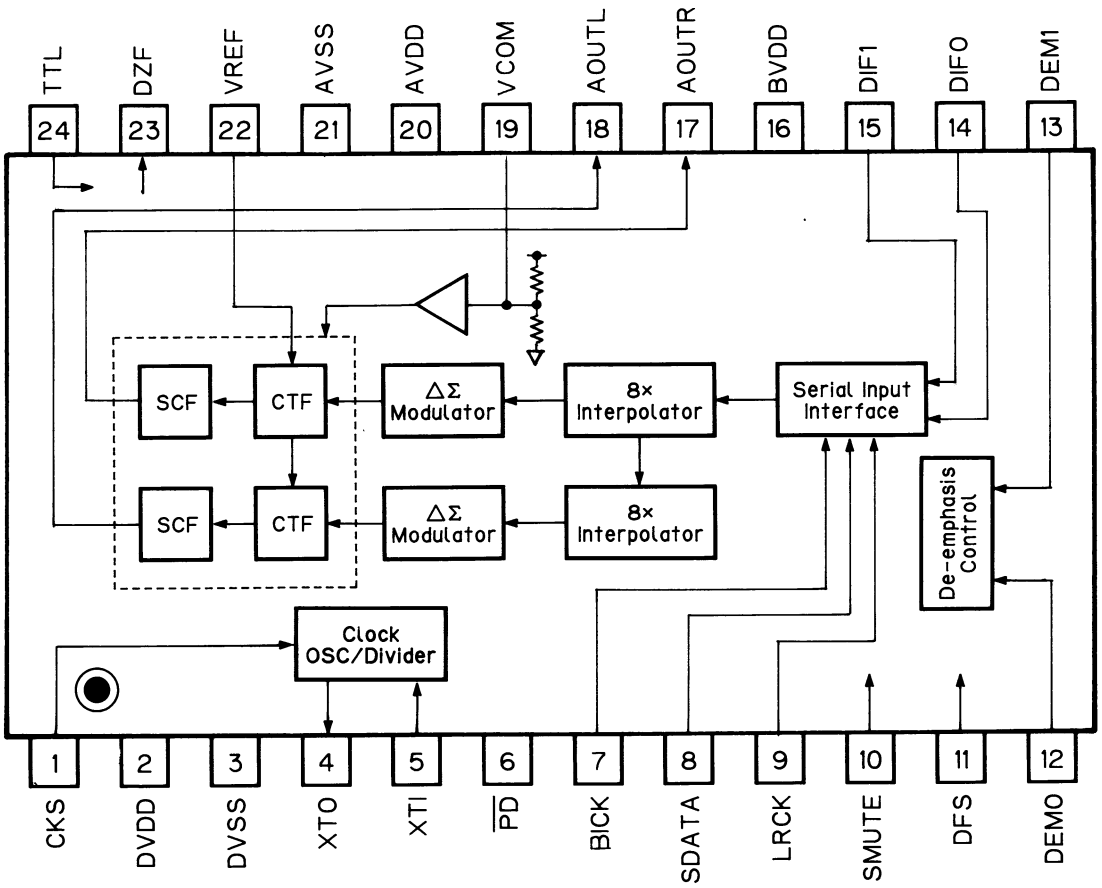
SAA2502H



● **Pin Functions (SAA2502H)**

Pin No.	Pin Name	I/O	Function and Operation
1	FSCLK	O	Sample rate clock output; buffered signal
2	SCK	O	Baseband audio data I²S clock output
3	SD	O	Baseband audio I²S data output
4	WS	O	Baseband audio data I²S word select output
5	TRST	I	Boundary scan test reset input
6	SPDIF	O	SPDIF baseband audio output
7	CCLK	I	L3 clock/I²C-bus bit clock input
8	CDATA	I/O	L3 data/I²C-bus serial data input/output
9	CMODE	I	L3 mode (address/data select input)
10	$\overline{\text{INT}}$	O	Interrupt request output; active LOW
11	RESET	I	Master reset input
12	STOP	I	Soft reset/stop decoding input
13	CDRQ	O	Coded data request output
14	CDCL	I/O	Coded data bit clock input/output
15	CD	I	MPEG coded data input
16	GND1		Ground 1
17	CDEF	I	Coded data error flag input
18	VDD1		Supply voltage 1
19	CDSY	I	Coded data byte or frame sync input
20	CDVAL	I	Coded data valid flag input
21	TMS	I	Boundary scan test mode select input
22	REFCLK	I	PLL reference clock input
23	PHDIF	O	PLL phase comparator output
24	TCK	I	Boundary scan test clock input
25	FSCLKIN	I	Sample rate clock input
26	X22IN	I	22.579 MHz clock oscillator input or signal input
27	X22OUT	O	22.579 MHz clock oscillator output
28	GND2		Ground 2
29	MCLK24	I	Master clock frequency indication input
30	VDD2		Supply voltage 2
31	MCLKOUT	O	Master clock oscillator output
32	MCLKIN	I	Master clock oscillator input or signal input
33	TDI	I	Boundary scan test data input
34	RGTPOS	O	Analog right channel positive output
35	RGTNEG	O	Analog right channel negative output
36	REFN	O	Low reference voltage input for analog outputs
37	REFP	O	High reference voltage input for analog outputs
38	LFTNEG	O	Analog left channel negative output
39	LFTPOS	O	Analog left channel positive output
40	TC0	I	Factory test scan chain control 0 input

AK4321VFP



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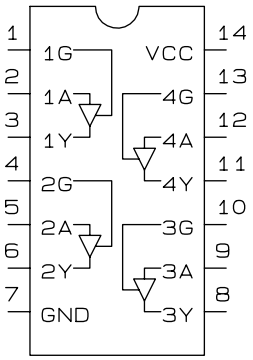

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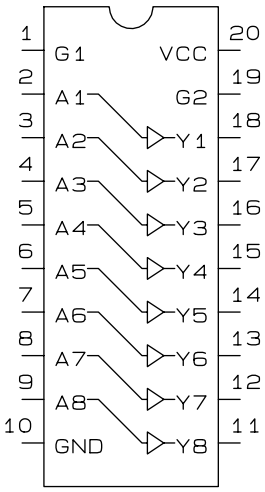

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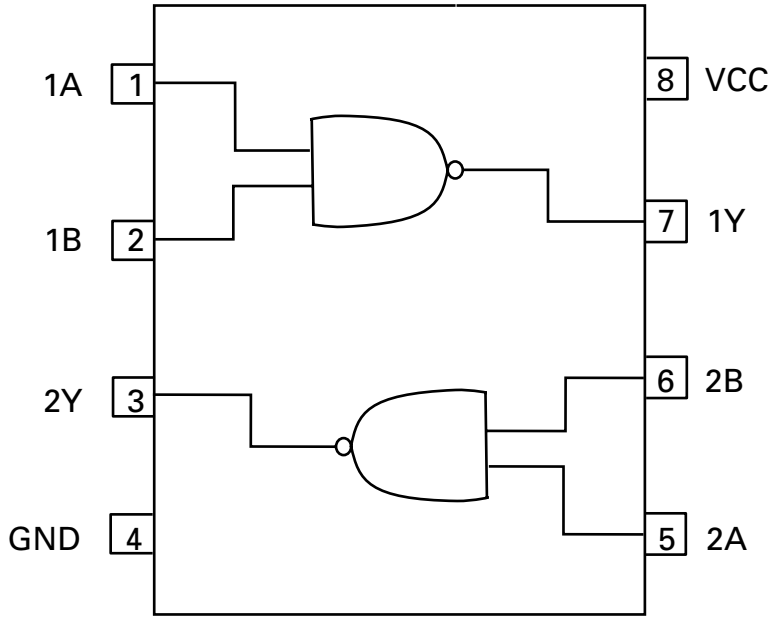

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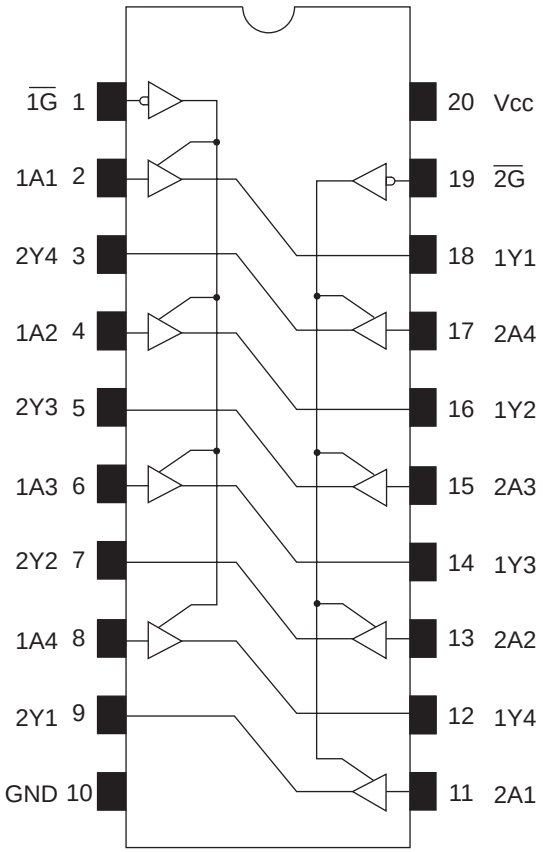

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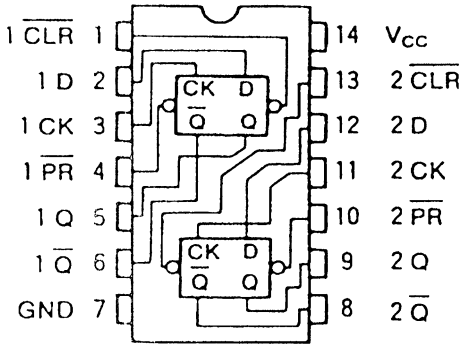

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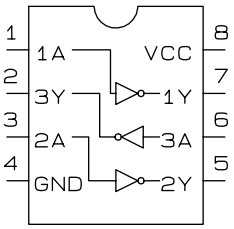

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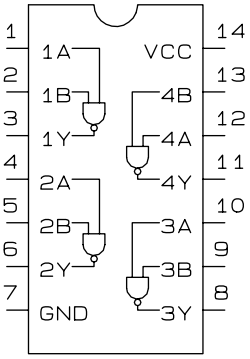

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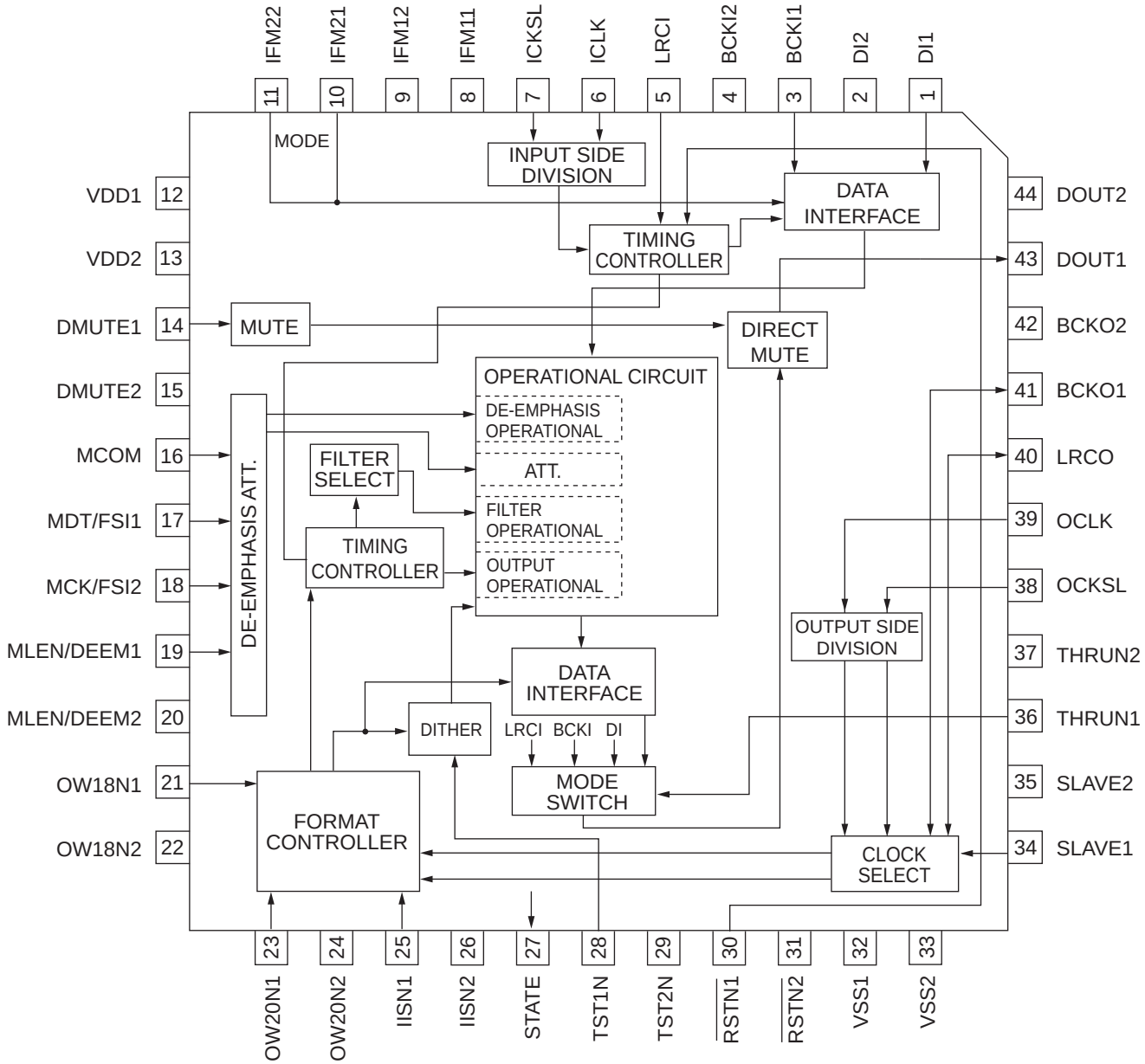

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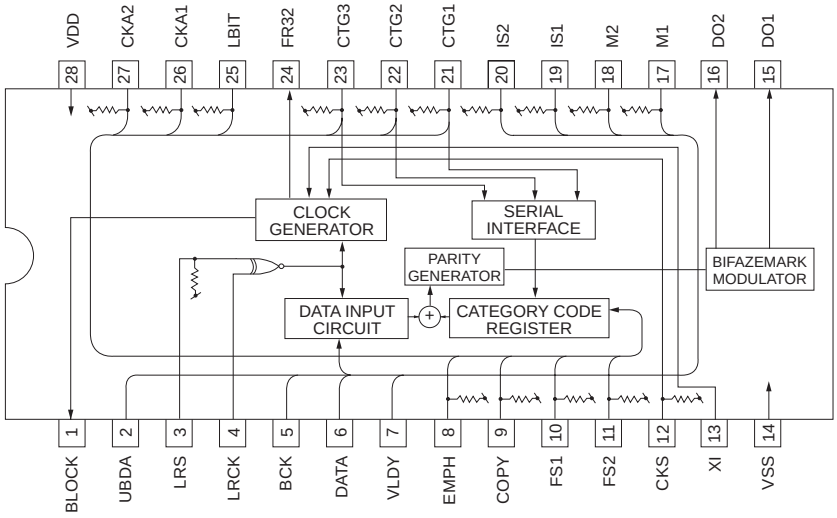

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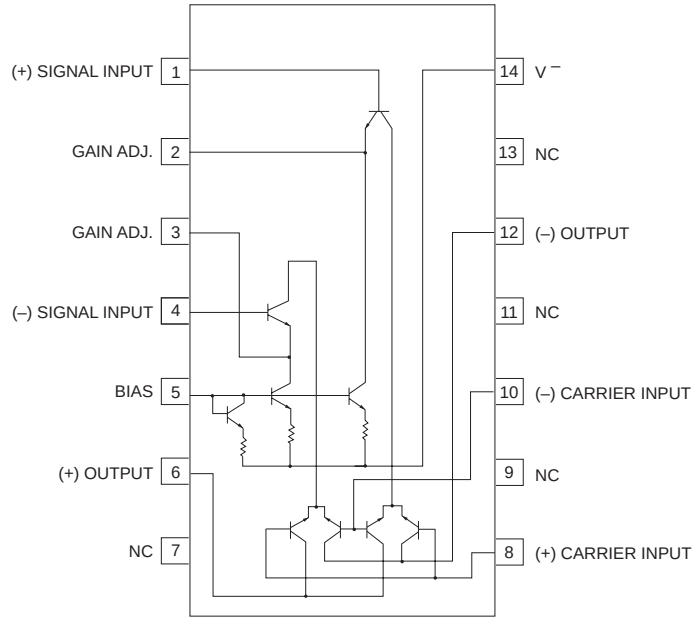

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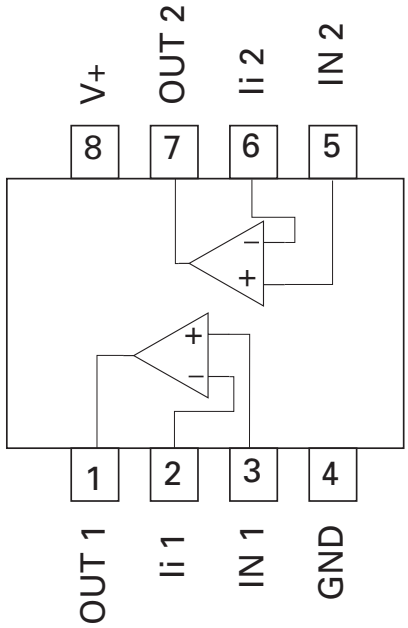
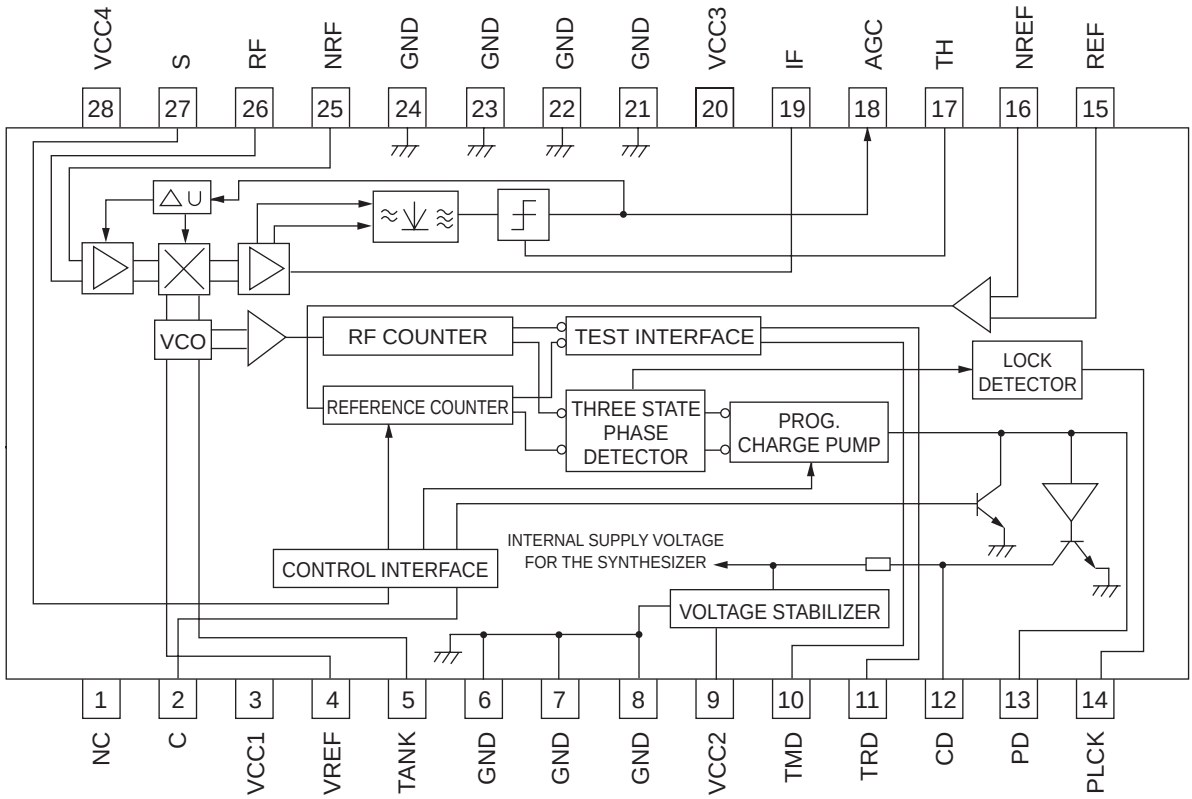


● **Pin Functions (U2730B-BFS)**

Pin No.	Pin Name	I/O	Function and Operation
1	NC		Not used
2	C	I	Control input
3	VCC1		Supply voltage
4	VREF		Reference pin of VCO
5	TANK		Tank pin of VCO
6-8	GND		Ground
9	VCC2		Supply voltage
10	TMD	O	Test output of main divider
11	TRD	O	Test output of reference divider
12	CD	O	Active filter output
13	PD	O	Three state charge pump output
14	PLCK	O	Lock indication output (open collector)
15	REF	I	Reference divider input
16	NREF	I	Reference divider input (inverted)
17	TH		Threshold voltage of comperator
18	AGC	I/O	Charge pump output of comperator, AGC input for amplifier and mixer
19	IF	O	Intermediate frequency output
20	VCC3		Voltage supply
21-24	GND		Ground
25	NRF	I	RF input (inverted)
26	RF	I	RF input
27	S	I	Control input
28	VCC4		Voltage supply

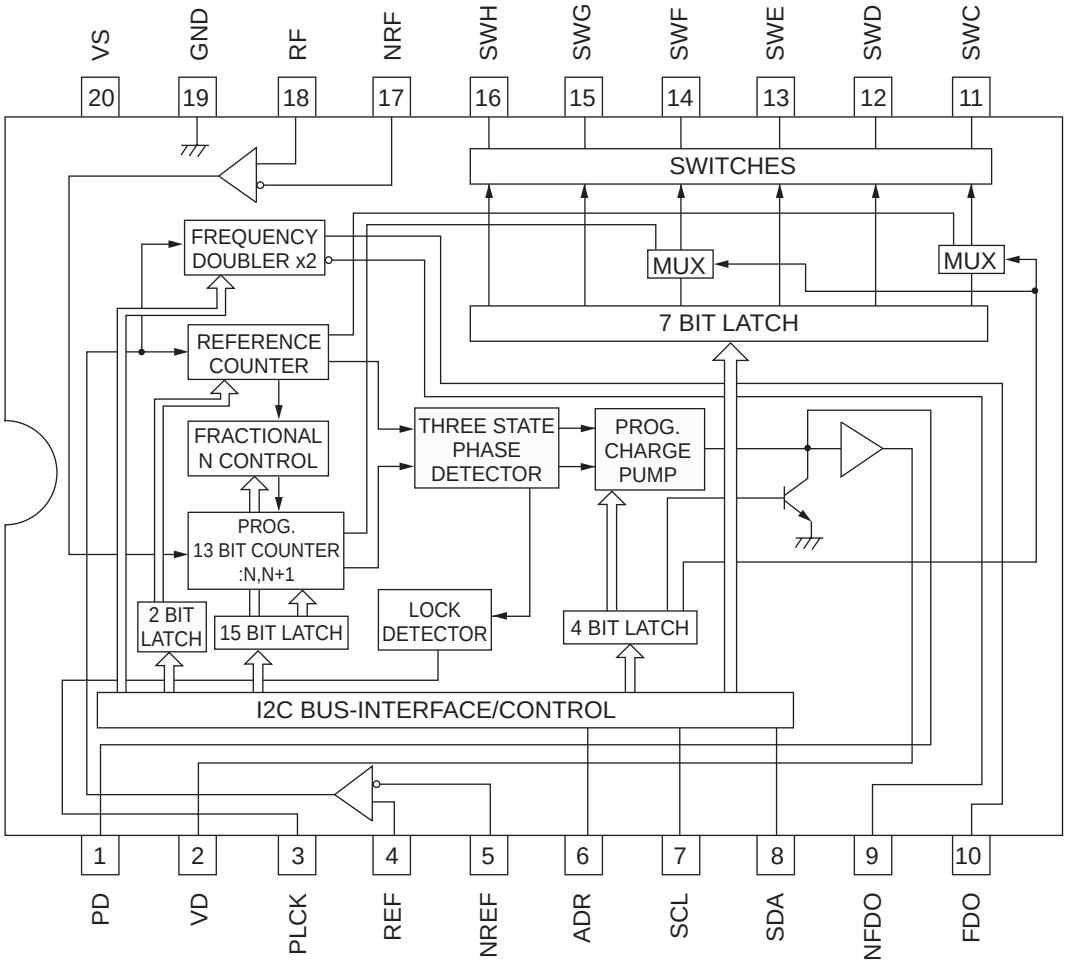
U2730B-BFS



● **Pin Functions (U2733B-CFS)**

Pin No.	Pin Name	I/O	Function and Operation
1	PD	O	Three-state charge pump output
2	VD	O	Active filter output
3	PLCK	O	Lock indicating output (open collector)
4	REF	I	Reference input
5	NREF	I	Reference input (inverted)
6	ADR		Address selection
7	SCL		Clock (I^2C)
8	SDA		Data (I^2C)
9	NFDO	O	Frequency doubler output (inverted, open collector)
10	FDO	O	Frequency doubler output (open collector)
11	SWC	O	Switching output (open collector)
12	SWD	O	Switching output (open collector)
13	SWE	O	Switching output (open collector)
14	SWF	O	Switching output (open collector)
15	SWG	O	Switching output (open collector)
16	SWH	O	Switching output (open collector)
17	NRF	I	RF input (inverted)
18	RF	I	RF input
19	GND		Ground
20	VS		Supply voltage

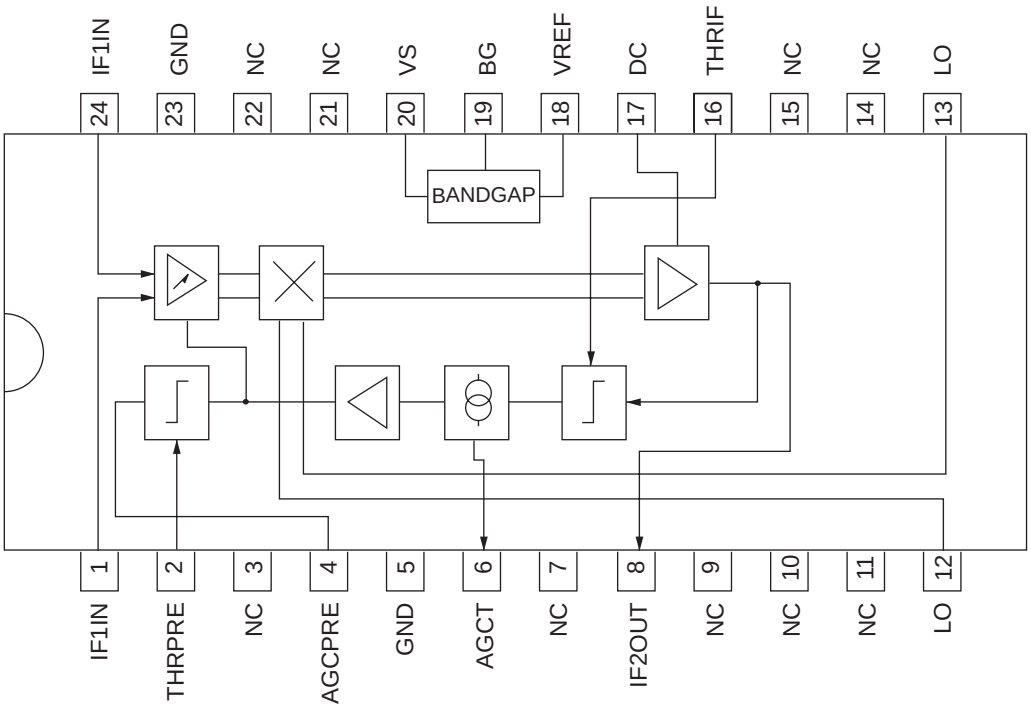
U2733B-CFS



● **Pin Functions (U2759B-AFL)**

Pin No.	Pin Name	I/O	Function and Operation
1	IF1IN	I	IF1 input
2	THRPRE	I	AGC-threshold for pre-amplifier
3	NC		Not used
4	AGCPRE		AGC for pre-amplifier
5	GND		Ground
6	AGCT	O	AGC time constant for IF amplifier
7	NC		Not used
8	IF2OUT	O	IF2 output
9-11	NC		Not used
12,13	LO		Local oscillator
14,15	NC		Not used
16	THRIF	I	AGC threshold for IF amplifier
17	DC		DC-level
18	VREF		Reference voltage
19	BG		Bandgap
20	VS		Supply voltage
21,22	NC		Not used
23	GND		Ground
24	IF1IN	I	IF1 input

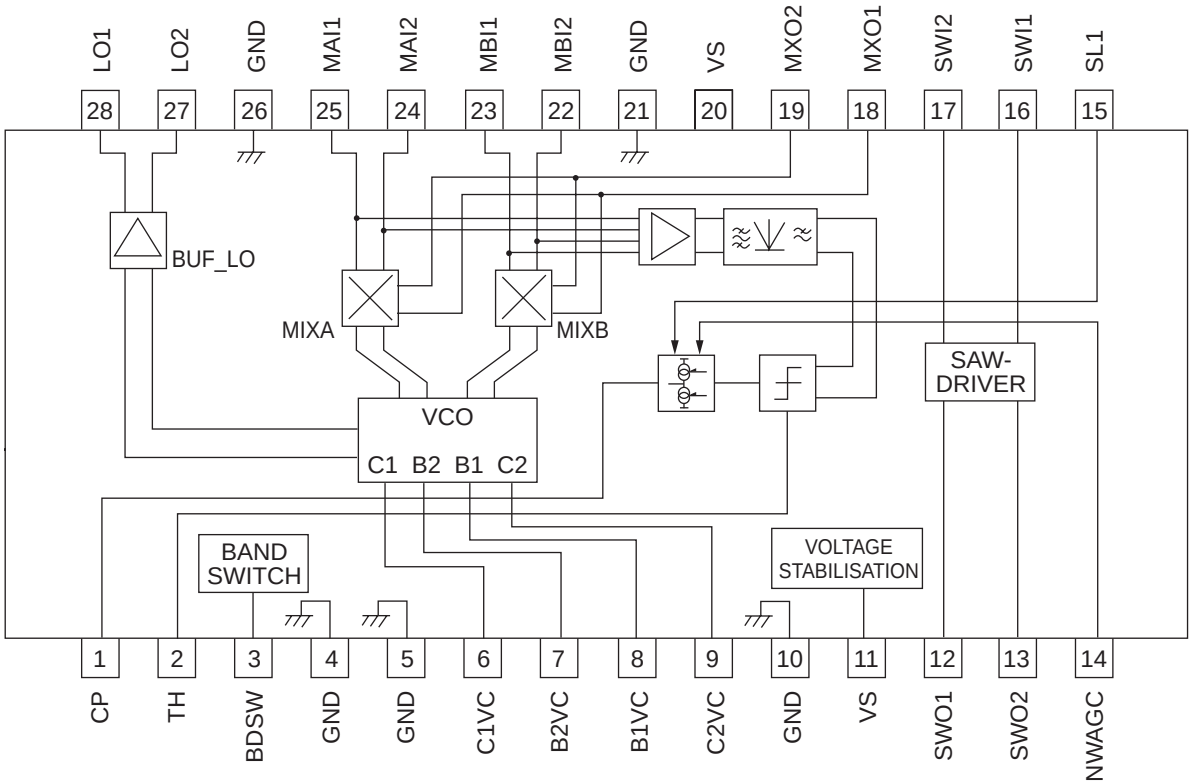
U2759B-AFL



● **Pin Functions (U2750B-BFS)**

Pin No.	Pin Name	I/O	Function and Operation
1	CP	O	Charge pump output of comparator
2	TH	I	Threshold input of comparator
3	BDSW	I	Band switch input
4,5	GND		GND
6	C1VC		Collector pin 1 of VCO
7	B2VC		Base pin 2 of VCO
8	B1VC		Base pin 1 of VCO
9	C2VC		Collector pin 2 of VCO
10	GND		GND
11	VS		Supply voltage
12,13	SWO1,2	O	Differential output of SAW-driver
14	NWAGC		AGC mode selection
15	SLI		AGC mode selection
16,17	SWI1,2	I	Differential input of SAW-driver
18,19	MXO1,2	O	Differential mixer output
20	VS		Supply voltage
21	GND		GND
22,23	MBI2,1	I	Differential input of mixer B
24,25	MAI2,1	I	Differential input of mixer A
26	GND		GND
27,28	LO2,1	O	Differential output of LO for PLL

U2750B-BFS

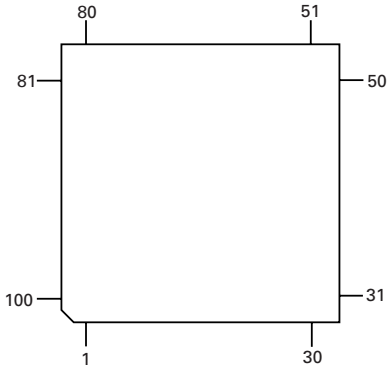


● **Pin Functions (PD5440A)**

Pin No.	Pin Name	I/O	Function and Operation
1,2	NC		Not used
3	DA1		Not used
4	DA0		Not used
5	NC		Not used
6	NULLIN	I	NULL signal input
7	NC		Not used
8	BYTE		External data bus wides select input
9	CNVSS		Processor mode select input
10,11	NC		Not used
12	$\overline{\text{RESET}}$	I	Reset input
13	XOUT	O	Clock oscillation output
14	VSS1		Power supply
15	XIN		Clock oscillation input (10MHz)
16	VCC1		Power supply
17	NMI	I	NMI input
18	CFIC	I	SAA3500 CFIC input
19	ASENS	I	Acc sense input (Acc-ON:H)
20	$\overline{\text{BSENS}}$	I	B.up sense input (B.up-ON:L)
21	IPIN1	I	Connect to 29pin
22	IPPW	O	IP-BUS Power supply SW
23,24	NC		Not used
25	L3EN	O	L3BUS input mode enable
26	PWMOUT	O	VCX0, PWM output
27,28	NC		Not used
29	IPIN2	I	IP-BUS input (KEYDISP input)
30	IPOUT	O	IP-BUS output (KEYDISP output)
31	L3OUT	O	L3BUS data output
32	L3IN	I	L3BUS data input
33	L3CLK	O	L3BUS clock output
34	L3MODE	O	L3BUS mode output
35	TxD	O	
36	AICDT	I	AIC data input
37	AICCLK	I	AIC clock input
38	AICWIN	I	AIC window input
39	$\overline{\text{INT2502}}$	I	SAA2502 INTERRUPT
40	$\overline{\text{ICRESET}}$	O	IC reset output (SAA3500)
41	OPTEN	O	Optical output enable
42	MPEGRES	O	IC reset output (SAA2502)
43	DABPW	O	DAB power supply SW
44	OPTPW2	O	Optical power supply SW
45	OPTPW1	O	Optical power supply SW
46	SYSPW	O	SYSTEM power supply SW
47	$\overline{\text{SFCRES}}$	O	IC reset output (SM5844)
48	DABMUTE	O	DAB mute output (non circuit)
49	SYSMUTE	O	SYSTEM mute output
50	$\overline{\text{BUSMUTE}}$	O	BUS mute output
51	MODEL	I	Destination sense input
52	NC		Not used
53	SEL2	O	Audio selector (OPT)
54	SEL1	O	Audio selector (IPBUS-line)
55	OPTSW	I	Light connector sense
56	$\overline{\text{DACSTBY}}$	O	DAC power down
57	DACMUTE	O	DAC mute
58	SFCMUTE	O	SFC (SM5844) mute
59	MPEGMUTE	O	MPEG (SAA2502) mute
60,61	NC		Not used

Pin No.	Pin Name	I/O	Function and Operation
62	VCC2		Power supply
63	NC		Not used
64	VSS4		Power supply
65-72	$\overline{\text{TEST7}}$-$\overline{\text{TEST0}}$	I	Testmode select SW
73-79	NC		Not used
80	$\overline{\text{TESTIN}}$	I	Test input for manufacture line
81-88	MOUT 7-0		Not used
89	NC		Not used
90	NULLSEL	O	NULL detect circuit select
91	I²C_DT	O	I²C data
92	I²C_CK	O	I²C clock
93,94	NC		Not used
95	ANTSENS	I	Antenna terminal short detect
96	AVSS		A-D power supply
97	SL	I	Signal level input
98	VREF		A-D reference voltage input
99	AVCC		A-D power supply
100	AGCW	I	AGC window input

*PD5440A



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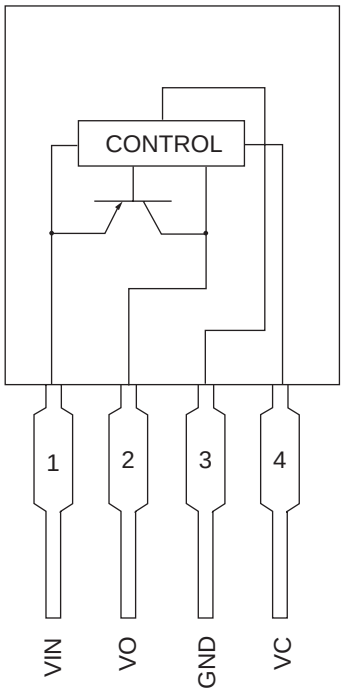

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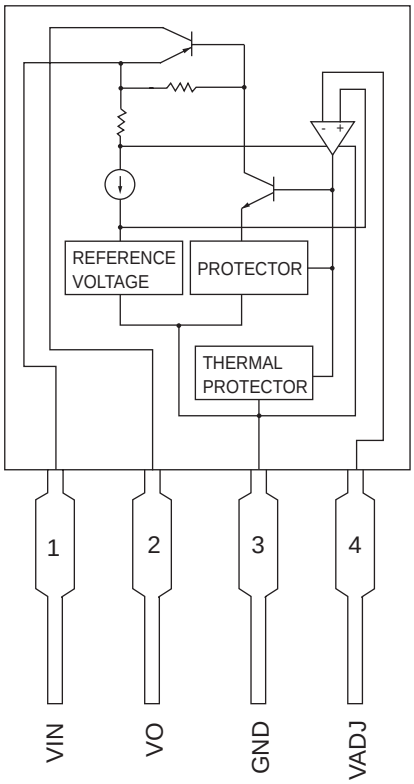


7.2 TEST MODE

This unit is used together with a DAB control unit (e.g. DEX-P99R/EW, etc.). During Test mode, use the keys on the DAB control unit.
All keys can be found on the remote control assembly, except the keys to enter Test mode.

- Entering Test mode:
  Press the TA and Track Down keys simultaneously to reset the system.
- Exiting Test mode:
  Set ACC to OFF.

● Keys used in Test mode

Left key	Manual DOWN	To receive a lower frequency block.
Right key	Manual UP	To receive a higher frequency block.
CH 1	Switches display.	Normal display ↓ (Press the CH1 key.) PLL IC communications checking display ↓ (After 2 seconds or when the CH 1 key is pressed) SAA 3500 communications checking display ↓ (After 2 seconds or when the CH 1 key is pressed) MPEG IC communications checking display ↓ (After 2 seconds or when the CH 1 key is pressed) Test display ↓ (Press the CH 1 key.) Returns to the normal display.
CH 2	Switches services.	Same as the Service UP key.
CH 3	ARC ON/OFF	Switches between ON and OFF of ARC.

Other keys are invalid.

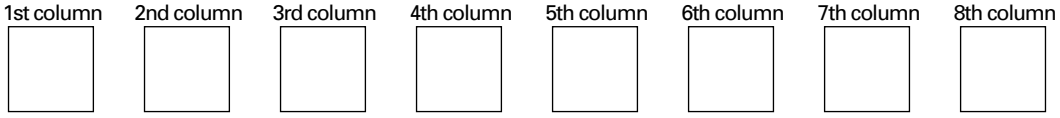
● Display in Test mode:

1) PLL IC communications checking display
   No problem was found: "PLL____OK"
   A problem was found: "PLL____ERR"

2) SAA 3500 communications checking display
   No problem was found: "DEC____OK"
   A problem was found: "DEC____ERR"

3) MPEG IC communications checking display
   No problem was found: "MPEG____OK"
   A problem was found: "MPEG____ERR"

4) Test display



• Estimated error rate of FIC

(1st column), (2nd column) (3rd column) E - (4th column)

• DAB mode

(5th column) 0 : Not identified.

1-4 : Transmission mode (DAB transmission mode)

• AFC detection

(6th column) 0 : AFC is not synchronized.

1 : AFC is synchronized.

• MPEG signal synchronous

(7th column) 0 : MPEG decoder is not synchronized.

1 : MPEG decoder is synchronized.

• MPEG signal error

(8th column) 0 : Normal

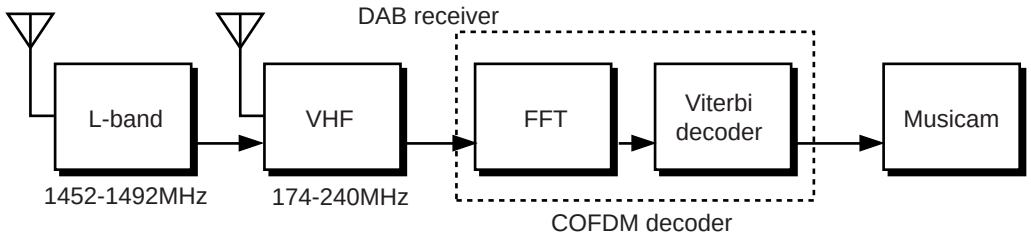
1 : Error in MPEG data.

7.3 EXPLANATION

7.3.1 CIRCUIT DESCRIPTION

● What is DAB?

Digital Audio Broadcasting (DAB) is digital broadcasting for mobile communications using the MUSICAM (MPEG Audio) audio compression system. The system was developed by the EUREKA 147 in Europe. For the digital modulation system, DAB uses Coded Orthogonal Frequency Division Multiplex (COFDM) based on multicarrier. Internationally, DAB is also called as SYSTEM A in ITU-R.



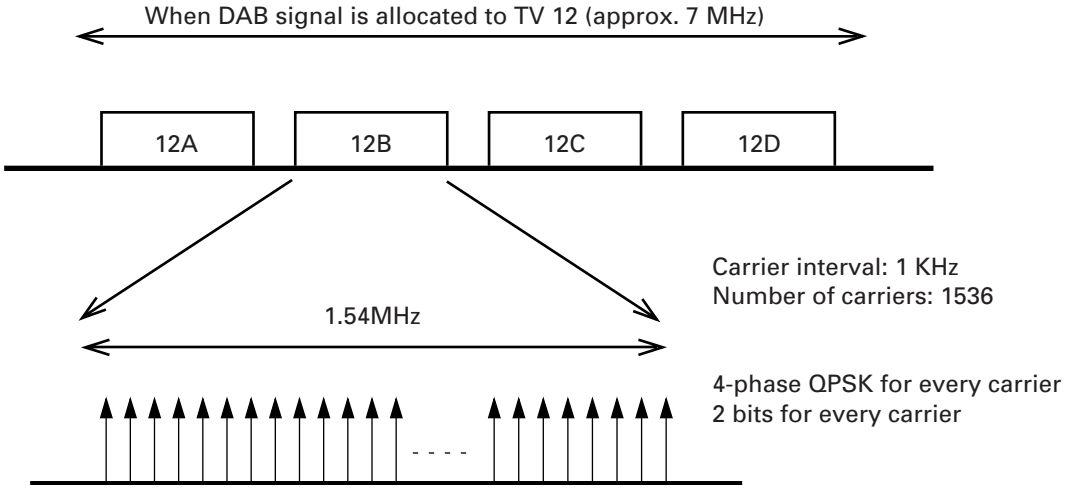
Digital broadcasting may be called differently in some countries or areas. Even if the system is the same as DAB, it may be called in different name.

DAR: Digital Audio Radio (IBOC, IBAC or DAB in the United States)
DRB: Digital Radio Broadcasting (DAB in Canada)
DSB: Digital Sound Broadcasting

● What is Coded OFDM?

Although OFDM technology has been known over years, it has recently attracted attention along with development of FFT technology. In DAB, the system encodes and transmits signal.

1) Encoding is error correction using convolutional code. Compared with codes used in CDs (block code), convolutional code is more effective to handle random errors. Generally, it is called Viterbi decoding.
2) DAB signal requires wide band (1.54 MHz), and is given priority to be allocated to 12 channels of TV in Europe (5-13 channels under the standard). Also used is L-band (1.5 GHz).



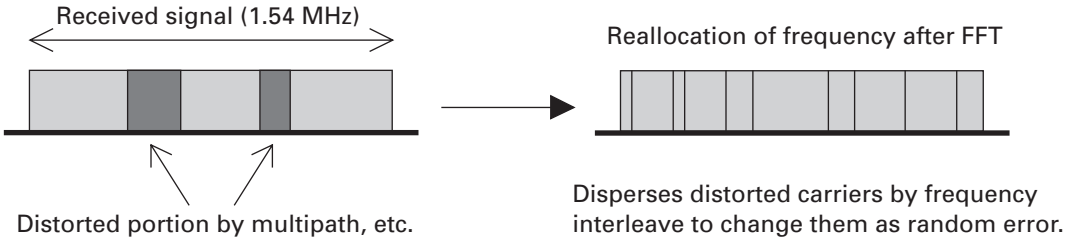
Calculating based on band mode 2 will be: 4 KHz × 384 = 1.536 MHz Thus, 1.54 MHz.

Mode 1	1 KHz (1536)	Band 3 (VHF)	SFN (terrestrial)
Mode 4	2 KHz (768)	L-Band (1.5 GHz)	SFN (suggested by Canada)
Mode 2	4 KHz (384)	L-Band (1.5 GHz)	Local (terrestrial and satellite)
Mode 3	8 KHz (192)	3 GHz	Cable

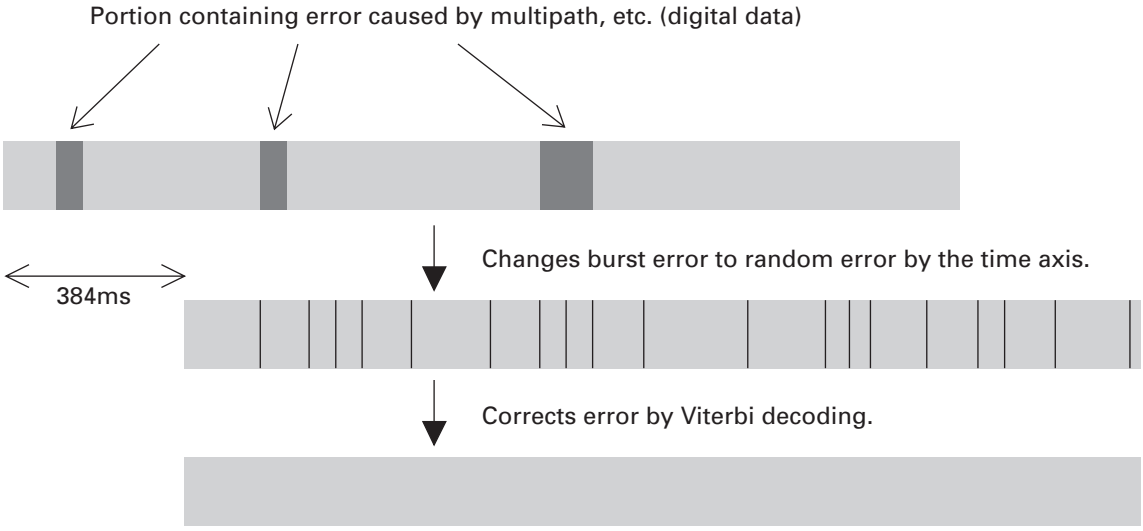
● Why DAB is More Effective with Multipath Than FM?

Different from FM, DAB systems are designed under the conditions that multipath exists. DAB disperses the portion that will be distorted by multipath, and corrects such part with error correction.

1) Frequency interleave


Received signal (1.54 MHz)
Reallocation of frequency after FFT
Distorted portion by multipath, etc.
Disperses distorted carriers by frequency interleave to change them as random error.

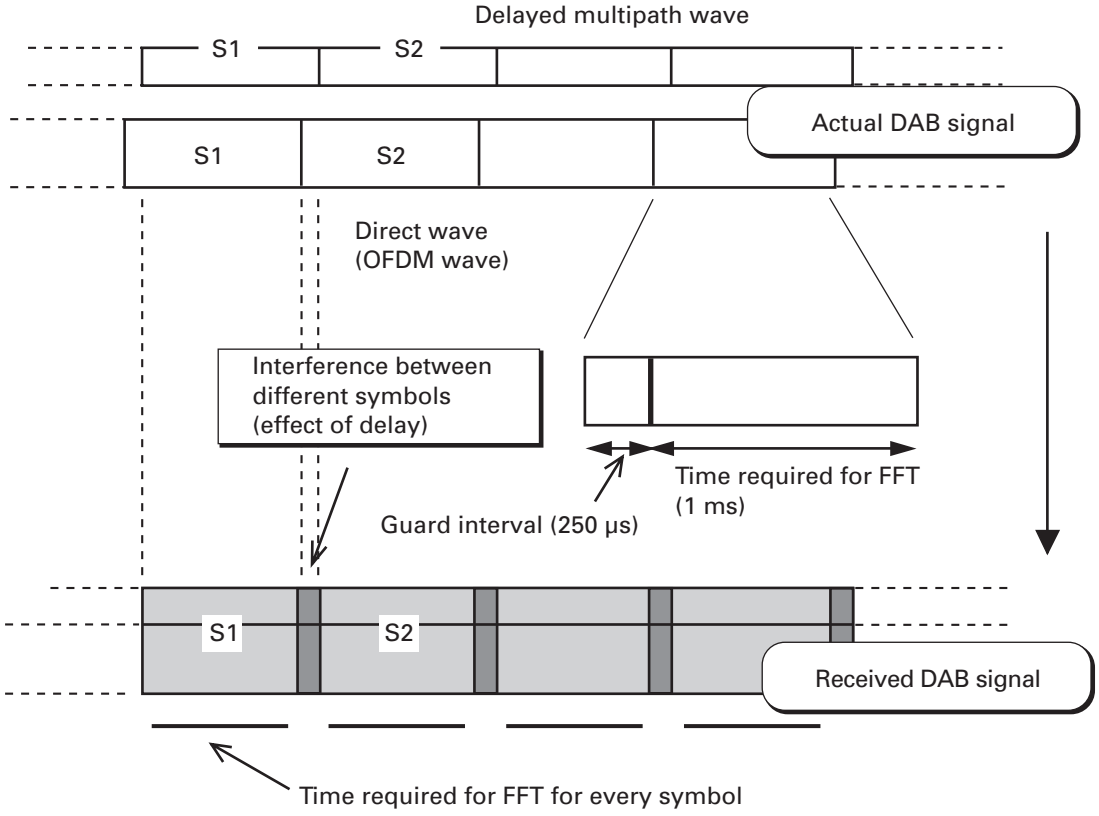
2) Time interleave


Portion containing error caused by multipath, etc. (digital data)
Changes burst error to random error by the time axis.
384ms
Corrects error by Viterbi decoding.

3) Guard interval

The time 25% more than the sampling time required for processing DAB signals by FFT is called "guard interval." For multipath within the time of guard interval, errors can be corrected in most cases, regardless of the D/U ratio.

Mode 1	2048 points (1 ms):	Number of samples required for FFT
	512 points (250 µs):	Guard interval

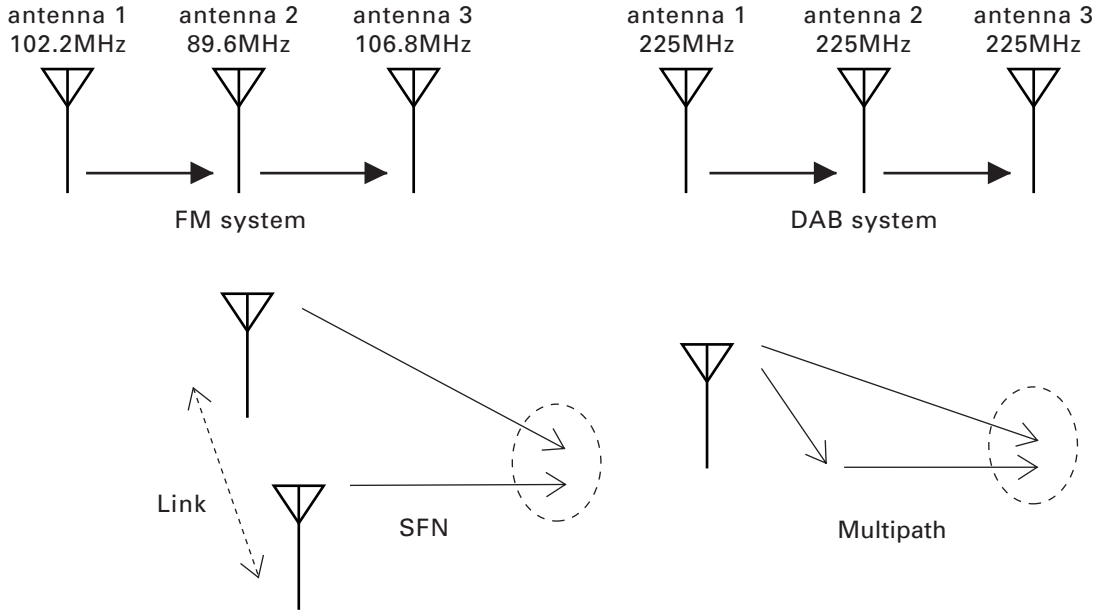


The time of guard interval depends on modes. Different time of guide interval is used for transmitting frequency, receiving speed (vehicle speed), etc.

● What is SFN?

Single Frequency Network (SFN) functions in the same way as with Network Follow (NF) of RDS. The principle of SFN uses the advantage of DAB that signals can be received for multipath having delay within the time of guide interval.

1) Different from FM, all transmitting antennas use the same frequency in SFN. Thus, completely muteless status can be achieved in NF.
2) SFN receives frequency from several antennas simultaneously. Thus, network gain may be obtained by several dBs.



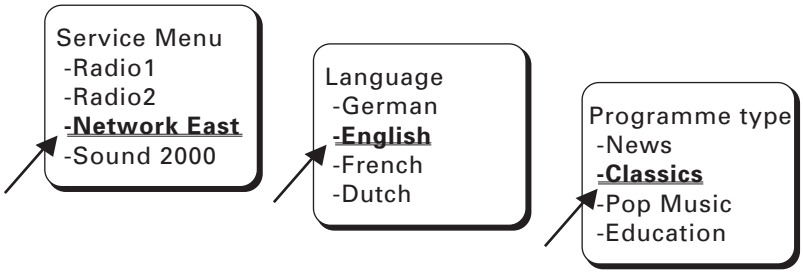
Viewing from the receiver, both SFN and mutipath behave in the same manner.

● Broadcasting Content

DAB can be considered as a system that can transmit the conventional seven broadcasting stations using a single broadcasting wave. New styles of broadcasting can be offered by replacing the content of broadcasting in audio signals with data.

1) Currently, audio quality equivalent to CD for a maximum of seven channels and RDS data of upward compatibility are transmitted. The capacity of every channel can be quickly changed by technology called "Dynamic Reconfiguration," thus can increase the number of channels.
2) DAB has transmission capacity of a maximum of 1.7 Mbps (larger than Video CD), thus various types of data can be transmitted.
3) We are planning to transmit navigation-related data, such as DGPS and TMC, in the future. The DAB signal itself has a simple system to detect its own position (TII: Transmitter Identification Information), implying a possibility of simplified navigation.

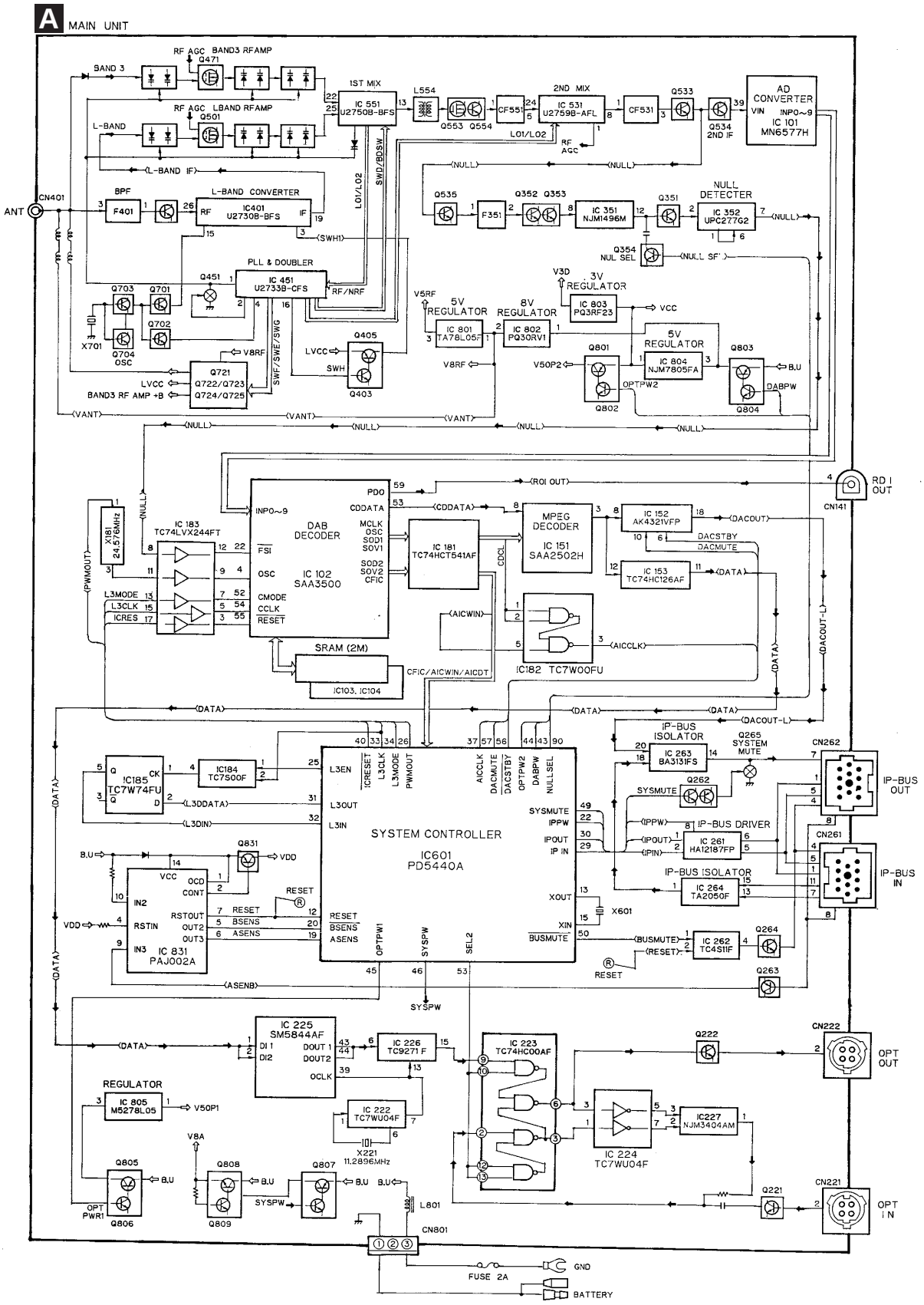
Actual selection of service using a DAB receiver will be as the illustration shown below
(a large display is required).



Currently, use of the DAB standard in future is examined in public organizations in Europe and other areas, including EUREKA 147, WorldDAB, EACEM, CENELEC, ETSI, and CEPT.

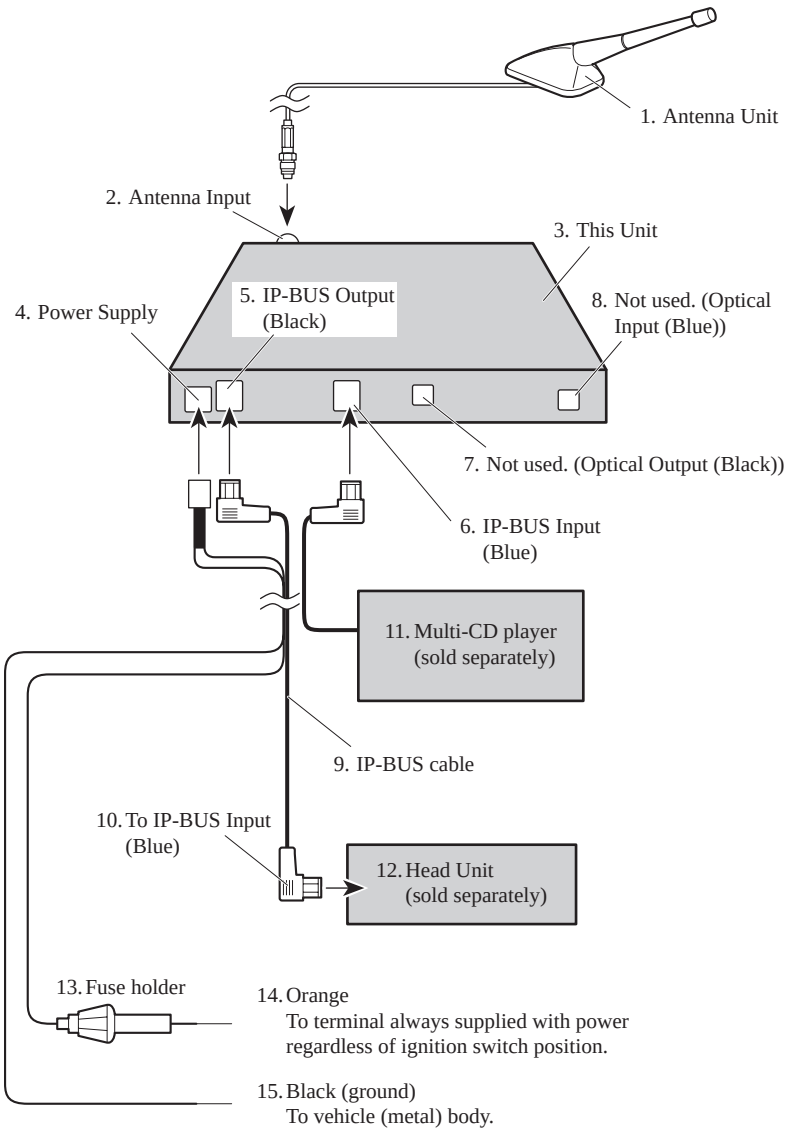
The latest information on DAB can be obtained from home page (http://www.kp.dlr.de/DAB/) via the Internet. The content is shown as a menu that links to detailed information.

7.3.2 BLOCK DIAGRAM



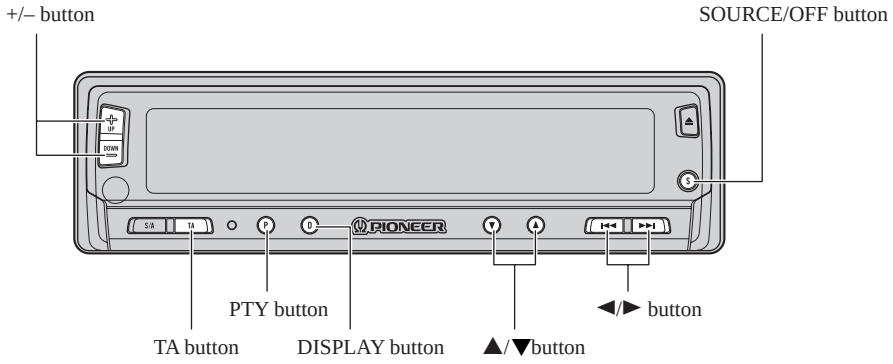
8. OPERATIONS AND SPECIFICATIONS

● Connection Diagram


1. Antenna Unit
2. Antenna Input
3. This Unit
4. Power Supply
5. IP-BUS Output (Black)
8. Not used. (Optical Input (Blue))
7. Not used. (Optical Output (Black))
6. IP-BUS Input (Blue)
11. Multi-CD player (sold separately)
9. IP-BUS cable
10. To IP-BUS Input (Blue)
12. Head Unit (sold separately)
13. Fuse holder
14. Orange
To terminal always supplied with power regardless of ignition switch position.
15. Black (ground)
To vehicle (metal) body.

Key Finder

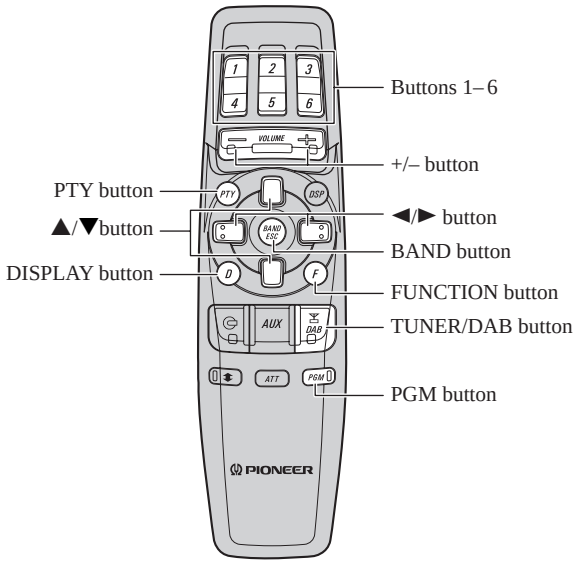
Head Unit (e.g. DEH-P945R)



Remote Controller (e.g. DEH-P945R)

Steering Remote Controller:

- You can operate in the same way with the Steering Remote Controller supplied with the Head Unit. For details, refer to the Head Unit's Operation Manual.



About the “DAB READY” Indicator

There’s a “DAB READY” indicator in the Head Unit’s display. This indicates DAB reception is possible.

“DAB READY”

Note:

- Head Unit Group 2 and 3 units do not feature a “DAB READY” indicator.

When listening to DAB

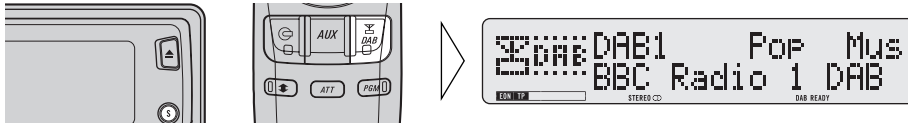
Lights during Ensemble reception.

When listening to a non-DAB source

Lights when in an area where DAB reception is possible.

Switching Power ON/OFF

- **Select DAB.**



Head Unit

Press the SOURCE/OFF button, and select DAB as follows.

Built-in CD Player → Tuner → DAB (Digital Audio Broadcasting) → Multi-MD Player → Multi-CD Player → AUX → ...

To switch the sources OFF, hold down the SOURCE/OFF button for 1 second or more.

Remote Controller

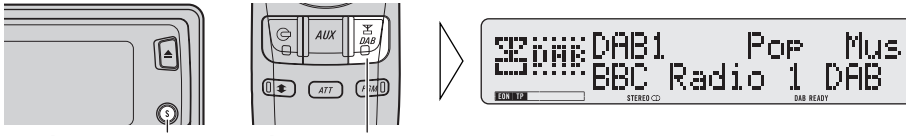
Press the TUNER/DAB button, and select DAB as follows.

Tuner → DAB (Digital Audio Broadcasting) → OFF

Basic Operation of DAB

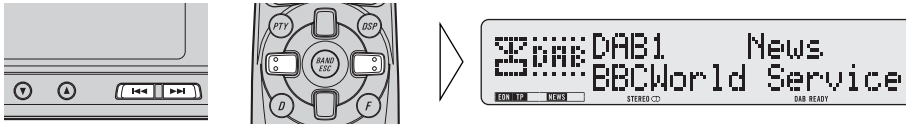
1. **Select DAB.**

When you first switch to DAB, Auto Seek is performed to find the highest Ensemble frequency. (Auto Seek is also performed in the same way each time you switch bands.)
Once Ensemble is received, Auto Seek ends.



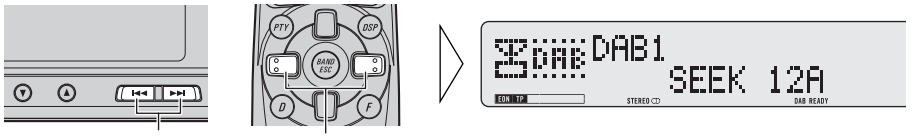
Each press changes the Source ... Each press changes the Source ...

2. **Select a desired Service.**



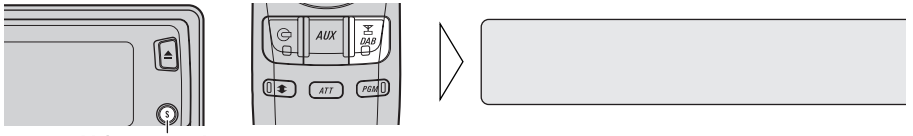
If you cannot find a desired Service, repeat step 2 after switching to Ensemble in step 3.

3. **Tune to a high or low frequency (Ensemble).**



Hold for 0.5 seconds Hold for 0.5 seconds

4. **Turn the source OFF.**

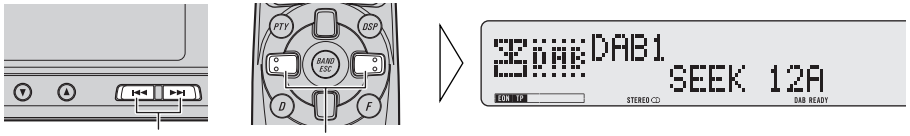


Hold for 1 second

Selecting the Ensemble

You can switch to an Ensemble offering a desired Service.

- **Tune to a high or low frequency (Ensemble).**



Hold for 0.5 seconds Hold for 0.5 seconds

By pressing the same button, search stops and the unit switches to standby for reception of that Ensemble frequency.

Note:
- The initial Language Filter setting is OFF.

Language Filter OFF

Priority is given to the first Service in a received Ensemble. After it is selected, sound of that Service's Primary Service Component is output.

Language Filter ON

Search for a Service Component of the set language among the received Ensemble is performed.

● When a Service Component is found

Sound of that Service Component is output.

● When a Service Component is not found

Priority is given to the first Service. After it is selected, sound of that Service's Primary Service Component is output.

General

Power source ..... 14.4 V DC (10.8 – 15.1 V allowable)
Grounding system ..... Negative type
Max. current consumption ..... 0.6 A
Dimensions ..... 231 (W) × 28 (H) × 182 (D) mm
Weight ..... 2.5 kg

DAB tuner

Frequency range
(Band III) ..... 174.928 – 239.200 MHz (5A – 13F)
(L Band) .... 1,452.960 – 1,490.624 MHz (L1 – L23)
Usable sensitivity
(Band III) ..... – 100 dBm
(L Band) ..... – 97.5 dBm
Mode ..... I, II, III, IV

Audio

Signal-to-noise ratio ..... 94 dB (IEC-A network)
Separation ..... 94 dB (1 kHz)

Antenna

Type ..... Active type

Note:
- Specifications and the design are subject to possible modification without notice due to improvements.